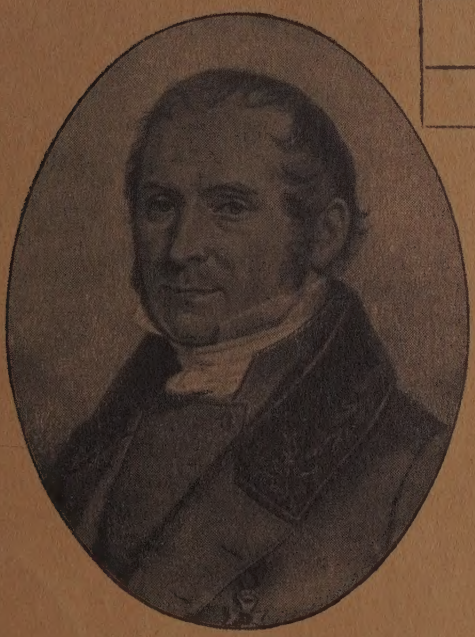
Ingold

FRIESIA

NORDISK MYKOLOGISK TIDSSKRIFT

CAB INTERNATIONAL
MYCOLOGICAL INSTITUTE
LIBRARY
10 JUN 1992
INGOLD, C.T.
1959



BIND VI HEFTE 3

KØBENHAVN 1959

JUBILÆUMSBERETNING
50-ÅRSJUBILÆET 30. SEPTEMBER - 4. OKTOBER 1955

INDHOLD

	Side
N. Fabritius Buchwald: Tale ved Jubilæumsmiddagen den 2. Oktober 1955. I Anledning af Foreningens 50-Aars Jubilæum 1. Oktober 1955	131
C. T. Ingold: Spore Discharge in Pyrenomycetes	148
Marcel Locquin: L'observation au microscope electronique des structures fines des Myxomycetes	164
J. A. Nannfeldt: The Mycofloristical Exploration of Scandinavia, especially Sweden	167
Meddelelser fra Foreningen til Svampekundskabens Fremme. 50-Aars Jubilæet 1955	214

*

REDAKTION:

N. F. BUCHWALD F. H. MØLLER

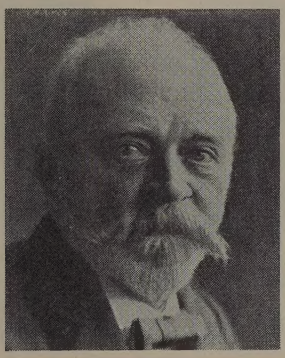
*

Udgivet af Foreningen til Svampekundskabens Fremme
Rolighedsvej 23, København V.

Trykningen afsluttet Januar 1960.

Hertz - Bogtrykkergaarden, København

FRIESIA . Bind VI . Hefte 3 . 1959



Læge C. MUNDT,
Formand fra 1905 til sin Død 1925.

TALE VED JUBILÆUMSMIDDAGEN DEN 2. OKTOBER 1955

I ANLEDNING AF
FORENINGENS 50-ÅRS JUBILÆUM 1. OKTOBER 1955

Af N. FABRITIUS BUCHWALD

Mine Damer og Herrer!

ELIAS FRIES, Nordens største Svampeforsker, Grundlæggeren af den systematiske Mykologi, har et Sted udtalt, naturligvis på Latin — FRIES lærte at tale Latin før sit Modersmål, fortæller han i sin Selvbiografi — følgende:

„Oportet societates mycophagas existere“,
„Der bør stiftes svampespisende Foreninger“,

en Udtalelse, som Foreningens tidligere Formand, Professor C. FERDINANDSEN, i sin Tale ved 25-Års Jubilæet (1930) mente vilde være et rammende Motto for vor Forening. Meningen med Udtrykket er den enkle, at det er nødvendigt at vække Folks Interesse for at samle og

spise Svampe, for det kan hænde, at en eller anden da bliver besnæret af Flora, når hun optræder i Høstgevandt, brændmet med spraglede, farvestrålende Svampe!

Og når det sker, løftes den pågældende, kan man sige, op i et højere Plan, fra det mere materielle, mykofage til det mere naturhistoriske, det mykologiske Plan, til det Plan, der kendetegnes ved Mottoet, som den britiske Svampeforening, „The British Mycological Society", har antaget, og som lyder:

„Recognosce notum, ignotum inspice"
„Genkend det kendte, udforsk det ukendte!"

— et Motto i øvrigt, der ikke specielt gælder for Mykologer, men som passer for enhver naturhistorisk Forening. Thi Hemmeligheden ved at tage på en naturhistorisk Ekskursion, hvad enten Interessen nu gælder Dyr, Planter eller Sten, ligger den ikke netop både i den store Glæde, der opstår, når man møder noget, man kender, og samtidigt i den Glæde, man føler, når man ved Granskning finder ud af noget nyt, noget ukendt?

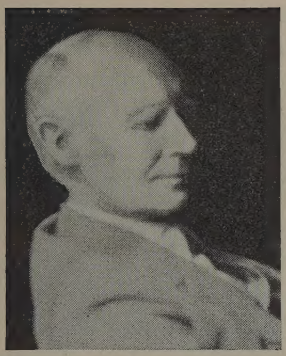
Vor Forenings Tilblivelse taber sig ikke i det dunkle. Tværtimod, den ligger vel oplyst, og er gentagne Gange blevet skildret i Foreningens første Tidsskrift, „Meddelelser fra Foreningen til Svampekundskabens Fremme", mest udførligt af Foreningens første og mangeårige Formand, Læge C. MUNDT.

Som Læge MUNDT fortæller, er det vanskeligt at sige, hvem der bør betegnes som den egentlige Stifter af Foreningen, da flere Kræfter virkede sammen til dens Dannelse.

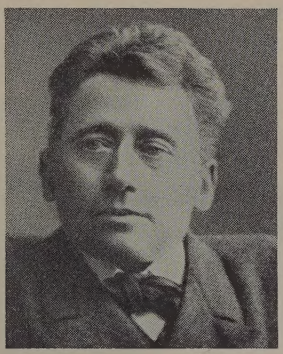
At netop 1905 blev Stiftelsesåret, har sin naturlige Forklaring deri, at dette År blev o v e r d å d i g t på Svampe.

Og vor første Hyldest må derfor gælde Gudinden Flora, fordi hun i det År lod fremtrylle et Mylder af Svampe. Og Foreningen er stadig i hendes Vold. Er hun os ikke nådig og lader Svampene udeblive, går det tilbage for Foreningen. Det har vi ofte nok erfaret.

I mange År forud for 1905 havde Læge MUNDT syslet med Spise- og Giftsvampe og forsøgt at udbrede Kendskab til dem i videre Kredse, men uden større Held. Allerede i 1887 udgav han 1. Udgave af sin senere så kendte lille Bog om spiselige og giftige Svampe, men som han også fortæller, kunde den, skønt billig, ikke just glæde sig ved nogen stor Afsætning. Senere er Bogen kommet i adskillige Udgaver, og „Mundt" hører nu til enhver Svampebegynders første Boganskaffelser.



Tandlæge H. MADELUNG,
Initiativtageren til
Foreningens Stiftelse;
Bestyrelsesmedlem 1906-13;
død i Canada 1948.



Direktør JUL. SCHIØTT,
det tredie Medlem af Triumviratet,
som stiftede Foreningen;
Bestyrelsesmedlem 1905-06
(† 1910).

Men i det rige Svampeår 1905 fik MUNDT, fortæller han videre, et særlig stærkt Anfald af sin årligt recidiverende Svampebegejstring — man mærker på Udtrykket Lægen —, og han begyndte at spekulere på, om der dog ikke kunde gøres noget ekstra for at delagtiggøre andre Mennesker i Glæden ved ikke blot at spise Svampe, men også ved i det hele at stifte nøjere Bekendtskab med dem.

Ved et Besøg på en Georgine-Udstilling, ikke i Haveselskabets Have, men i Zoologisk Have, fik han så den Idé at lade Georgine-Udstillingen afløses af en Svampeudstilling. Den daværende Direktør for Zoologisk Have, JULIUS SCHIØTT greb øjeblikkelig med Begejstring Ideen og fik med den ham egne livfulde Energi og Dygtighed hurtig vakt Interesse for Sagen.

SCHIØTT havde i mange År deltaget ivrigt i et almindeligt Oplysningsarbejde, bl. a. i det daværende Studentersamfund. Særlig kendt er han blevet som mangeårig Redaktør af det store populær-videnskabelige Foretagende „Frem", der som Devise bar de kendte Ord „Lys over Landet" og „Kundskab er Magt". MUNDT var derfor kommet til den rette Mand. SCHIØTT sørgede for, at der blev stødt i Trompeten i alle Blade, så at Publikum formeligt blev bombarderet med Svampeartikler!

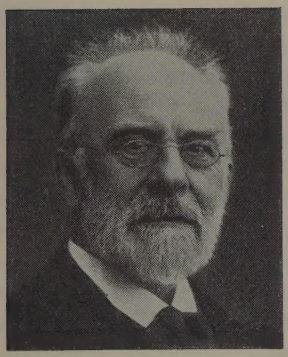
Og en righoldig Svampeudstilling kom ved manges forenede Kræfter på Benene, en Udstilling, som besøgtes af et stort Publikum.

Udstillingen skabte den frugtbare Grobund, af hvilken Foreningen som en Svamp hurtigt skulde skyde op.

Mærkeligt nok blev det ikke MUNDT selv, men Tandlæge H. MADELUNG i Hillerød, som først, i en Artikel i Bladet „Dannebrog", slog til Lyd for Dannelsen af en Forening af svampeinteresserede, og han er således den, der har undfanget Ideen. Den blev grebet med Entusiasme af SCHIØTT, der straks satte sig i Forbindelse med Tandlæge MADELUNG og Læge MUNDT. På Foranledning af dette Triumvirat samledes nu en Kreds af svampeinteresserede Mennesker i Zoologisk Haves Restaurant Søndag den 1. Oktober 1905, Kl. 10 Fm., og på dette Møde blev det hurtigt vedtaget at danne en Forening med det Formål „at udbrede Kendskab til Svampene samt at lære Befolkningen at benytte dem som Fødemiddel og nøje kende de spiselige Arter fra de giftige". Om Foreningens Navn var der derimod en Del Diskussion. Det korte og velklingende Navn „Danmarks Svampeforening", som nogle foreslog, blev forkastet af Flertallet, der mente, at det var for indbydende for Folkevittigheden. At kalde Foreningen f. Eks. „Dansk mykologisk Forening" har man næppe turdet indlade sig på, og det var utvivlsomt rigtigt set. Bortset fra nogle ganske få Mennesker var der ingen, som den Gang vidste, hvad Ordet Mykologi dækker over. I Dag, 50 År senere, er der derimod adskillige, som ved det, takket være bl. a. Foreningens Virksomhed og Udgivelsen af „Dansk mykologisk Ekskursionsflora".

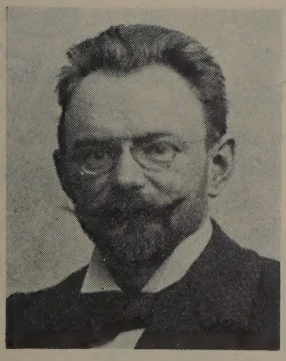
Kogebogsforfatterinde KRISTINE JENSEN (Mærke: »Frk. J.«), Bestyrelsesmedlem 1909-21.

Foreningen fik da det lange og noget tunge Navn, „Foreningen til Svampekundskabens Fremme". At det er et besværligt Navn, som faktisk kun anvendes på Papiret, ved vi alle. Hertil kommer, at „Svampekundskab" i det moderne Øre lyder forældet. Der er noget antikveret over Navnet, noget der leder Tanken hen på Ord som Oldkyndighed o. lign. Ved Telefonopringninger, på Regninger til Foreningen o.s.v. ser man da heller ikke sjældent, at den benævnes „Foreningen til Svampekunstens Fremme" eller ..... til Svampekulturens Fremme". Nutidens Mennesker er ikke dus med Kundskab; nu hedder det snarere Forskning.

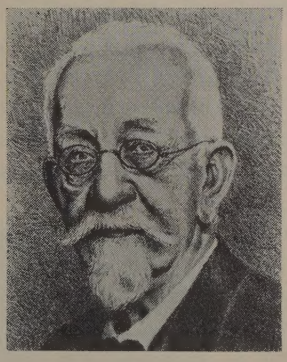


Professor EMIL CHR. HANSEN,
Bestyrelsesmedlem fra 1905 til
sin Død 1909.

Kgl. Mundkok J. FREITAG,
Bestyrelsesmedlem 1905-08;
død 1922.



Overretssagfører FR. KNUDSEN,
Vejle,
Bestyrelsesmedlem 1905-09;
død 1948.



Skolebestyrer JØRGEN MELCHIOR,
København,
Bestyrelsesmedlem fra 1910 til
sin Død 1925.

Og i Foreningen selv kaldes den altid Mand og Mand imellem kort og godt „Svampeforeningen", og det er i øvrigt vist meget sjældent, at udenforstående trækker på Smilebåndet, når dette Ord nævnes. Skulde Foreningen derfor i Dag have Navn, vilde der næppe rejse sig Betænkeligheder ved at døbe den „Dansk Svampeforening". Men det vilde naturligvis være en Helligbrøde at omdøbe Foreningen!

Men nu tilbage til Foreningens Stiftelse!

Vi har set, at den blev stiftet ved de forenede Kræfter af et Triumvirat. Den egentlige Initiativtager var Tandlæge H. MADELUNG. Han var Gnisten, som fik JULIUS SCHIØTT's letfængelige Tønder til at slå ud i lys Lue, men det var Læge MUNDT, der skulde komme til at værne om den en Gang skabte Ild. Det blev MUNDT, der som Foreningens Formand i de følgende 20 År — han døde 1925, — blev dens egentlige „Sjæl", og det endda i så høj Grad, at Foreningen blandt Medlemmerne ofte blev kaldt „Dr. Mundts Forening".

I denne Forbindelse forekommer det mig at være af Interesse at fremhæve, at vor Forening i k k e er opstået som en Aflægger af „Dansk botanisk Forening". Ingen af de tre Stiftere havde Tilknytning til Botanisk Forening. Den er udsprunget af Lægmænds Arbejde, ganske vist alle med akademisk Uddannelse, men ingen med botanisk Faguddannelse. Snarere må Foreningen siges at være født af den stærke Bevægelse for populær-videnskabelig Oplysning, som gik hen over Landet i Tiden omkring Århundredskiftet, og som satte en af sine smukkeste Blomster i Udgivelsen af det før nævnte „Frem", hvis initiativrige Redaktør JUL. SCHIØTT var. Professor FERDINANDSEN har derfor utvivlsomt Ret, når han i sin Tale ved 25-Års Jubilæet udtalte, at på Trods af det rige Svampeår 1905, på Trods af Dr. MUNDT og på Trods af Tandlæge MADELUNG's Bestræbelser, var vor Forening

Ekskursion til Bøllemosen og Eremitagesletten 7.10.1917. I Forgrunden lidt til højre C. MUNDT; i Baggrunden F. H. MØLLER og V. HERTZ.

næppe blevet stiftet, „hvis ikke JUL. SCHIØTT med et Par gode Mandshænder havde viklet Ungen ud af Svøbet og mir nichts dir nichts sendt den over i Virkeligheden".

Således er i korte Træk Beretningen om Tilblivelsen af vor Forening for 50 År siden, den Begivenhed, som vi i disse Dage fejrer. Der kan naturligvis slet ikke ved denne Lejlighed blive Tale om at behandle Foreningens 50-Års Tilværelse i Enkeltheder. Det forbyder simpelt hen Tiden, og desuden vilde det være at stille alt for store Krav til Medlemmernes Tålmodighed på en Festaften som denne. Jeg må indskrænke mig til et kort Overblik over Foreningens Virksomhed.

Ekskursion til Hornbæk Plantage 24.8.1930. Fra venstre: Fru WINDING, C. FERDINANDSEN, N. F. BUCHWALD, V. HERTZ og H. T. MANICUS.

Foreningen har, som rimeligt er, været underkastet Udviklingens Lov. Den har gennemløbet flere Etaper, og den er naturligvis i Dag ikke helt det samme som det, den var for 50 År siden.

Ser man nærmere på Foreningens Historie, vil det være naturligt at dele den i tre Afsnit, tre Perioder:

1. Periode: 1905—1911
2. — : 1912—1930
3. — : 1931—1955.

1. Periode (1905—1911). Den første, ret kortvarige Periode på 7 År kan passende betegnes som Pionertiden. Det var en Ungdommens Tid, i hvilken mange forskellige Ideer og Projekter fremsattes; de fleste faldt til Jorden og bragte kun Skuffelser. Man havde således Planer om, at det skulde være en landsomfattende Forening med sagkyndige Konsulenter rundt om i Landet. Disse Planer måtte hurtigt opgives. Man fremsatte en Plan om Oprettelse af en Svampekontrol. Foreningens utrættelige Formand, Læge MUNDT, udarbejdede en Tavle med 14 af de almindeligste giftige og spiselige Svampe, og denne Tavle fremstilledes i 2000 Eksemplarer, som det var Meningen at fordele dels til Medlemmerne, dels til Skovarbejderne på de forskellige Skovdistrikter, ledsaget af en Opfordring til Indsamling af Svampe til Forhandling i København og andre Byer, hvor fornøden Kontrol med For-

handlingen kunde tilvejebringes. Planen mislykkedes totalt, og gentagne Forsøg senere på at oprette en Svampekontrol, f. Eks. på Københavns Grønttorv, er ligeledes ganske strandede. Således besidder Danmark stadig ikke en Svampekontrol som vore Nabolande, Norge og Sverige. Der synes åbenbart ikke herhjemme at være de nødvendige Betingelser.

Noget bedre gik det med en Plan om at holde offentlige Foredrag over populære og letfattelige Emner. Der holdtes enkelte Foredrag i Årene 1909—11, men Bestyrelsens Håb om, at en sådan „Tvangsfodring med Svampe" i Vinterhalvåret skulde skærpe Appetitten, slog imidlertid fejl, og Foredragene måtte snart opgives. Først i 1917 kom man ind på den Ordning, som fortsat består, nemlig at knytte et eller to Foredrag til Generalforsamlingen. Meget mere tror jeg heller ikke Foreningen i Dag magter m. H. t. Foredragsvirksomhed, vel at mærke hvis Foredragene vedbblivende skal have en populær-videnskabelig Karakter.

2. Periode omfatter Tidsrummet 1912—1930 og markeres først og fremmest ved Stiftelsen og Udgivelsen af et Tidsskrift, „Meddelelser fra Foreningen til Svampekundskabens Fremme".

På et Bestyrelsesmøde i September 1911 fremsatte de to unge botaniske Magistre, Ø. WINGE og C. FERDINANDSEN, der begge meget tidligt var kommet ind i Bestyrelsen og hurtigt blev Foreningens videnskabelige Ballast — den ene af dem har vi den Glæde at have lyslevende mellem os her i Aften — de fremsatte Forslag om, at Foreningen skulde påbegynde Udgivelsen af et Tidsskrift. I Forordet til det første Hefte, der så Lyset i Januar 1912, hedder det, at man ikke finder de Midler, hvorved Foreningen hidtil har virket, tilstrækkelige, idet „det kun er de i København og Omegn bosatte Medlemmer, som normalt kan nyde godt af dem, og udenbys boende har egentlig ingen Glæde haft af at være Medlemmer af Foreningen udover den derved at støtte en god Sag". For at råde Bod på dette Misforhold påbegyndtes derfor Udgivelsen af et Tidsskrift, der fik det meget lange Navn „Meddelelser fra Foreningen til Svampekundskabens Fremme".

Stiftelsen af et Tidsskrift må siges at have været en særdeles lykkelig Idé. Selv om Tidsskriftet kun var lille, blev det dog af den største Betydning som et godt Bindeled mellem Medlemmerne, noget konkret og fast, der blev tilbage, når Ekskursioner og Udstillinger

Mag. scient. C. FERDINANDSEN,
fot. 1913.
Bestyrelsesmedlem 1909-1944,
Formand 1930-44.

Mag. scient. Ø. WINGE,
fot. 1913.
Bestyrelsesmedlem 1908-1956,
Formand 1925-30.

var til Ende. Foruden Ekskursionsberetninger og andre Meddelelser fra Foreningens Virksomhed bragte Tidsskriftet små Afhandlinger af populær-videnskabeligt Indhold, ofte af stor Interesse, og Meddelelser om Fund af sjældne Svampe. Alle danske Svampeforskere, der i den Periode beskæftigede sig med Storsvampe, har skrevet i Tidsskriftet og givet vigtige Bidrag til Udforskning af Danmarks Storsvampeflora; først og fremmest må nævnes de to Redaktører, FERDINANDSEN og WINGE.

Tidsskriftets Betydning viste sig hurtigt ved en glædelig Stigning i Medlemsantallet; det steg fra 233 i 1912 til 328 i 1913, alså med næsten 100 Medlemmer! I Dag er der tæt op mod 600 Medlemmer!

En anden vigtig Faktor, der bidrog til Foreningens Vækst, var Påbegyndelsen af „Mykologisk Ekskursionsflora", en

Ekskursion til Grib Skov 14.9.1930. I Midten P. M. WILKENS og længst til højre E. DEHN.

Ekskursion til Tisvilde Hegn 1.9.1935. Foran »Sandkroen«. Fra venstre: Frk. IDA BLÆSBJERG, flere Damer, E. DEHN, H. T. MANICUS og R. HESTEHAVE.

populær Vejledning til Bestemmelse af danske Storsvampe. Denne Flora, der udarbejdedes af de to Redaktører af „Meddelelserne", Magistrene FERDINANDSEN og WINGE, udkom i Ark som Bidrag til Tidsskriftet. Alle Beskrivelser og Afbildninger af de i Floraen optagne Svampearter (ialt 539 Arter) var fuldstændigt originale, udførte efter Naturen. Udgivelsen strakte sig over mange År, idet Floraen først afsluttedes i 1928. Den vandt stor Påskønnelse, ikke alene her i Landet, men også i de øvrige nordiske Lande. Ved sin helt gennemførte Originalitet kan Floraen uden Overdrivelse betegnes som det anseligste Monument over Foreningens Virksomhed i Perioden 1912—1930.

3. Periode (1931—1955). Denne Periode, som ikke kan siges at være afsluttet, kendetegnes især ved to Hovedbegivenheder, nemlig Stiftelsen af et nordisk mykologisk Tidsskrift, „Friesia" og Udgivelsen af „Flora Agaricina Danica". Perioden kan, hvis det ikke lyder for prætentiøst, betegnes som den videnskabelige i Foreningens Virksomhed.

I 1930 afsluttedes 4. Bind af „Meddelelser". Selv om de fire Bind, der da var udkommet, kun er små, indeholder de dog tilsammen godt 450 Sider. Når man betænker, at „Mykologisk Ekskursionsflora" udgaves i samme Tidsrum, er det dog ikke nogen helt ringe Præstation, navnlig i Betragtning af de små Pengemidler, Foreningen da rådede over. Det årlige Medlemskontingent var indtil 1920 kun 2 Kr., fra 1920 3 Kr.! Nu er det 6 eller 10 Kr.!

I 1931 opstod i Bestyrelsen den Tanke, om det ikke var muligt at udvide Tidsskriftet på en noget bredere Basis og gøre det til et Centralorgan for Udforskning af Storsvampe i

hele Norden. En Henvendelse herom, underskrevet af 19 Mykologer i Danmark og 7 Mykologer i det øvrige Norden, udsendtes da i December 1931 til ca. 125 mykologisk interesserede i Finland, Norge og Sverige foruden til en Række biologisk interesserede i Danmark. Fra så godt som alle Sider gav man Tanken sin uforbeholdne Tilslutning, flere var begejstret for den, f. Eks. Professor C. RAUNKIÆR, og Bestyrelsen besluttede da at indlede Forarbejderne til Tidsskriftets Udgivelse. Man havde tænkt sig at kalde Tidsskriftet „Friesia" til Ære for den berømte svenske Mykolog ELIAS FRIES, hvis Værker, ikke mindst på Storsvampenes Område, havde været af grundlæggende Betydning for den mykologiske Videnskab. Da Bestyrelsen på en Henvendelse specielt til de svenske Mykologer, om de havde noget at indvende mod Anvendelsen af Navnet „Friesia", fik ubetinget Tilslutning hertil, vedtog man at kalde Tidsskriftet „Friesia" med Undertitlen „Nordisk mykologisk Tidsskrift", og i September 1932 udkom da det første Hefte. Indtil nu er der publiceret fire ret anselige Bind (ca. 1550 Sider), og i Øjeblikket er 5. Bind under Udgivelse. Heftet for 1955 (Bd. 5, Hefte 2) er netop blevet udsendt i disse Dage i Anledning af 50-Års Jubilæet og er, som De vil vide, viet Mindet om ELIAS FRIES, efter hvem Tidsskriftet bærer Navn.

Jeg skal ikke komme nærmere ind på en Omtale af „Friesia" —

Ekskursion til Hæsede Skov 4.10.1936. Foran »Villa Gallina«. Fra venstre bl. a.: F. H. MØLLER, G. MUNKVAD (med Botaniserkasse), C. FERDINANDSEN, V. HERTZ, O. STORCH, N. F. BUCHWALD, J. P. JENSEN, W. BARKHUUS og E. BROCKMEYER.

det skulde være overflødigt i denne Kreds — men blot udtale, at Tidsskriftet i sin Karakter er videnskabeligt, idet det bortset fra Foreningsmeddelelser tilstræber kun at bringe Originalafhandlinger. Det indeholder Bidrag fra Mykologer i alle de skandinaviske Lande, mange affattet på Engelsk eller Tysk og i hvert Fald så godt som alle forsynet med et Resumé på et af disse Sprog.

I de sidste Par Bind er der også udkommet Afhandlinger om andre Svampe end Storsvampe, og det er Redaktionens Tanke at fortsætte ad denne Linie.

Tidsskriftet har langsomt banet sig Vej, også uden for Nordens Grænser. Der er for Tiden ca. 100 Abonnenter på „Friesia" uden for Danmark, nemlig ca. 60 Abonnenter i de øvrige skandinaviske Lande og ca. 40 uden for Skandinavien, og det er naturligvis vort Håb, at Abonnentantallet fremdeles vil stige.

Den anden store Begivenhed, der fandt Sted i den her skildrede Periode, er Udgivelsen af Jakob E. Lange's anselige Monografi over de danske Bladhatte. Initiativet til Udgivelsen af dette Værk, der med en Reminiscens fra dansk Botaniks betydeligste Storværk „Flora Danica" fik Navnet „Flora Agaricina Danica", udgik også fra vor Forening, idet Beslutningen herom toges på den mykologiske Kongres i København i September 1932, og Planerne nærmere udarbejdedes ved det følgende Års Kongres, der også fandt Sted i København. Det må betragtes som dansk mykologisk Forsknings hidtil største Indsats. En nærmere Omtale af Værket turde være unødvendig.

Men ved Siden af denne videnskabelige Virksomhed, som Foreningen navnlig har udøvet i de sidste 25 År, har den dog ikke glemt den anden og ikke mindre vigtige Opgave, nemlig Oplysningsvirksomheden, Udbredelsen af Kendskabet til vore Spise- og Giftsvampe, og det sker frem for alt ved Afholdelse af Svampeekskursioner under sagkyndig Vejledning. Ekskursionerne har altid været og må fortsat vedblive at være det centrale, Tyngdepunktet i Foreningens Virksomhed, og det er derfor ikke nogen Tilfældighed, når „Afholdelse af Svampeture" i Foreningens Love nævnes først blandt de Midler, Foreningen tager i Brug for at opfylde dens Formål: Udbredelse af Kendskabet til Svampene såvel rent naturvidenskabeligt som praktisk.

Når en Forening, hvis Medlemmer samler sig om et så specielt Emne som Svampe, tilmed i et lille Land som Danmark, ikke alene

har kunnet bestå i 50 År, men tilmed vokse sig stor og stærk, tror jeg, at Årsagen hertil for en væsentlig Del må søges i, at der gennem alle Årene har bestået en nøje Samvirken mellem Praksis og Videnskab, mellem den interesserede Lægmand, Amatørmykologen og Fagmykologen. Begge Parter har vist sig nødvendige, den ene Part har ikke kunnet undvære den anden.

Lad os ønske og håbe, at der også i Fremtiden herhjemme må findes videnskabeligt uddannede Mykologer, som er villige til at træde i Oplysningens Tjeneste til Gavn for Foreningens Formål: den fortsatte Udbredelse af Kendskabet til Svampe.

Idet vi hylder Mindet om Foreningens Stiftere og Pionerer og samtidigt udtaler Ønsket om Foreningens fortsatte Trivsel, beder jeg Dem alle med mig udbringe et trefoldigt Leve for „Foreningen til Svampekundskabens Fremme".

Ekskursion til Suserup Skov 11.9.1955. Fra venstre: Fru KIRSTINE TROYER, Frk. INGEBORG GAMMELGAARD, V. HERTZ, J. P. JENSEN næsten skjult af K. BJØRNEKÆR (med Ryggen til), GASTON OTTOSEN og D. MÜLLER.

TIDSTABEL FOR 1931-1955

For Perioden 1905-1930 henvises til Oversigten i C. FERDINANDSEN: Til 25-Aars Jubilæet (1930).

1931, 26. Februar. Bestyrelsens Sammensætning: Professor C. FERDINANDSEN Formand, Øjenlæge V. HERTZ Næstformand, Civilingeniør I. A. VAN DEURS Kasserer, Assistent N. F. BUCHWALD Sekretær, Byretsdommer K. MUNDT, Ingeniør P. M. WILKENS og Professor Ø. WINGE. Suppleanter: Kommunelærer F. H. MØLLER og Kommunelærer K. BJØRNEKÆR.

1931, December. En Henvendelse om Stiftelse af et Centralorgan for Udforskningen af nordiske Storsvampe udsendes til mykologisk interesserede i alle de nordiske Lande.

1932, September. Det første Hefte af „Friesia, Nordisk mykologisk Tidsskrift" udsendes under Redaktion af C. FERDINANDSEN og N. F. BUCHWALD.

1932, September. Tanken om Udgivelse af Forstander JAKOB E. LANGE's Billedværk over danske Bladhatte drøftes på den mykologiske Kongres i København.

1935, September-Oktober. Foreningen afholder det første Kursus i Bestemmelse af Storsvampe for Begyndere.

1935, September-Oktober. Foreningen afholder den første Svampeudstilling sammen med Det kgl. danske Haveselskab. Udstillingerne har siden da været afholdt i Haveselskabets Have.

1935, Efteråret. Første Del af Vol. I (40 Tekstsider og 16 Farvetavler) af J. E. LANGE: „Flora Agaricina Danica" udsendes.

1936, 28. Februar. Civilingeniør I. A. VAN DEURS træder ud af Bestyrelsen og erstattes af 1. Suppleant, Kommunelærer F. H.MØLLER. Viceskoleinspektør M. P. CHRISTIANSEN vælges til 2. Suppleant.

1940, Efteråret. Vol. V af „Flora Agaricina Danica" udgives, hvormed dette Værk afsluttes.

1941, 27. December. Forstander JAKOB E. LANGE afgår ved Døden.

1942, 20. Februar. Foreningens mangeårige Kasserer, Civilingeniør, Lektor I. A. VAN DEURS afgår ved Døden.

1942, 31. December. Medlemsantallet når op på 533 og passerer dermed for første Gang i Foreningens Historie Tallet 500.

1943, Foråret. Foreningen modtager for første Gang fra Undervisningsministeriet et Tilskud (600 Kr.) til Trykning af „Friesia". Foreningen har siden da været på Finansloven.

1943, 16. Maj. Det årlige Kontingent, der siden 1920 havde været på 3 Kr., forhøjes til 4 Kr. fra 1. Januar 1944.

1944, 28. Marts. Formanden, Professor C. FERDINANDSEN afgår ved Døden. — Sekretæren, Amanuensis N. F. BUCHWALD vælges til Formand.

1944, 8. September. En 18-årig ung Dame, Frk. GRETHE HORSTMAN, der kun havde været Medlem knap 1 År, afgår ved Døden efter at have spist Snehvid Fluesvamp *(Amanita virosa)*. Dødsfaldet er det første sikre i Danmark som Følge af Forgiftning med denne Svampeart.

1945, 28. Februar. Kommunelærer F. H. MØLLER udtræder af Bestyrelsen. Kommunelærer K. BJØRNEKÆR og Assistent, cand. mag. E. BILLE HANSEN indvælges i Bestyrelsen. Kommunelærer F. H. MØLLER indtræder i Stedet for Professor FERDINANDSEN i Redaktionen af „Friesia".

1945, 9. September. På Ekskursionen til Geelskov og Ørholm når Antallet af Deltagere op på 180 og sætter dermed Rekord i Foreningens Historie. Det hidtil højeste Antal, ca. 150 Deltagere, nåedes på Ekskursionerne den 27. September 1942 (Hareskov) og den 15. Oktober 1944 (Ermelunden og Jægersborg Dyrehave).

1945, 31. December. Foreningens Medlemstal kulminerer med 671.

1946, Efteråret. Foreningen afholder forsøgsvis to Ekskursioner på samme Søndag i den Hensigt at nedbringe Deltagerantallet på den enkelte Ekskursion.

1946, Oktober. Formanden, Professor N. F. BUCHWALD deltager på Foreningens Vegne i „British Mycological Society"s 50-Års Jubilæum.

1947, 26. Februar. Foreningen beslutter fra 1948 at udgive Rubrikkerne „Foreningsmeddelelser" og „Notitser" i „Friesia" også som en særskilt Publikation under Titlen „Meddelelser fra Foreningen til Svampekundskabens Fremme". Ny Række. Kontingentet forbliver 4 Kr. for de Medlemmer, der modtager „Meddelelser", men forhøjes til 6 Kr. for „Friesia".

1947, Efteråret. Som Følge af den usædvanligt tørre og varme Sommer 1947 sætter Efterårssæsonen Bundrekord m. H. t. Svampeudbyttet.

1948, Efteråret. Restgælden (7000 Kr.) på „Flora Agaricina Danica" til Carlsbergfondet og Rask-Ørsted Fondet udbetales til Fondene.

1950, Foråret. Foreningen modtager for første Gang sin Andel i Netto-Udbyttet ved Salget af „Flora Agaricina Danica" i 1949, nemlig 3000 Kr., der henlægges til en særlig Fond, „Flora Agaricina Danica-Fonden".

1950, Foråret. Undervisningsministeriets årlige Tilskud til Trykning af „Friesia" forhøjes fra 600 Kr. til 1000 Kr.

1950, Juli. Overlærer F. H. MØLLER repræsenterer Foreningen på Den 7. internationale botaniske Kongres i Stockholm.

1951, 21. Februar. Fundatsen for „Flora Agaricina Danica-Fonden", tilhørende „Foreningen til Svampekundskabens Fremme", stadfæstes.

1953, 10. Maj. Det årlige Kontingent forhøjes til 6 Kr. for Medlemmer, der modtager „Meddelelser", og til 10 Kr. for Medlemmer, der modtager „Friesia".

1955, 28. Februar. Bestyrelsen har følgende Sammensætning: Professor N. F. BUCHWALD Formand, Øjenlæge, Dr. med. V. HERTZ Næstformand, Overlærer K. BJØRNEKÆR Kasserer, Amanuensis E. BILLE HANSEN Sekretær, Retspræsident K. MUNDT, Direktør P. M. WILKENS og Professor, Dr. phil. Ø. WINGE. Suppleanter: Postmester J. P. JENSEN og Dr. phil. MORTEN LANGE.

LITTERATUR

Buchwald, N. Fabritius: JAKOB E. LANGE. 2. April 1864-27. December 1941. — Friesia 2: 209-220. 1943.

— : Professor, Dr. phil. C. FERDINANDSEN. 18. Februar 1879-28. Marts 1944. — Ibidem 3: 83-93. 1945.

Ferdinandsen, C.: Til 25-Års Jubilæet. Træk af vor Forenings Historie i Anledning af dens 25-årige Stiftelsesdag. — Medd. Foren. Svampek. Fr. 4: 105-115. 1930(1931).

— **& Winge, Ø.:** I Anledning af Læge C. MUNDT's 75-Års Fødselsdag. — Ibidem 2: 51-52. 1918.

Mundt, C.: Danmarks spiselige Svampe. 2. Udg. Fortalen. — København 1906.

— : Af vor Forenings Historie. — Medd. Foren. Svampek. Fr. 1: 35-38. 1913.

Endvidere er benyttet Foreningsmeddelelserne i »Friesia« og »Meddelelser fra Foreningen til Svampekundskabens Fremme«, I-IV, 1912-30.

FRIESIA . Bind VI . Hefte 3 . 1959

SPORE DISCHARGE IN PYRENOMYCETES

By C. T. INGOLD

Birkbeck College, University of London.

Lecture at the Scientific Session of the Jubilee Meeting of the Danish Mycological Society, Copenhagen, 3 October 1955.

I feel very honoured to have been invited to speak at the Scientific Session of this Jubilee Congress.

The subject of Spore Discharge in Pyrenomycetes is a large one and if I were to give a general treatment, it would be rather superficial. I propose, therefore, to base my considerations largely on *Daldinia concentrica* Ces. & de Not., pointing out, however, how discharge in this species differs from that in other members of the group.

STRUCTURE AND ECOLOGY OF DALDINIA

First it is necessary to consider briefly the general ecology of the fungus. *Daldinia concentrica* is a very common species in Britain although, I understand, it is rare in Denmark. In my country it occurs on dead branches and fallen trunks of ash *(Fraxinus)*. Very occasionally it is to be found on beech *(Fagus)*. It also occurs quite commonly on birch *(Betula)* and gorse *(Ulex)*, but only after these have been scorched by fire.

The perennial mycelium occurs in the wood, but the large hemispherical stroma, often the size of half a large apple, lasts only for a year. When split radially the hard black stroma is characterized by the concentric zoning of its tissue (Fig. 1) caused by regions of thick-walled hyphae alternating with regions were the hyphal walls are not so thick. It seems likely to me that these concentric growth

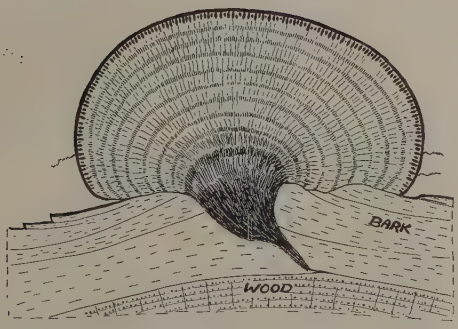


Fig. 1. *Daldinia concentrica.* Section through perithecial stroma. Discharged spores are seen in the air. From three perithecia spores are escaping as spore tendrils. Natural size.

zones are in fact daily zones and their number is probably an indication of the time involved in the formation of the stroma.

If a stroma is examined in late September it is of a greyish-brown colour and covered by a conidial stage which also is found in cracks

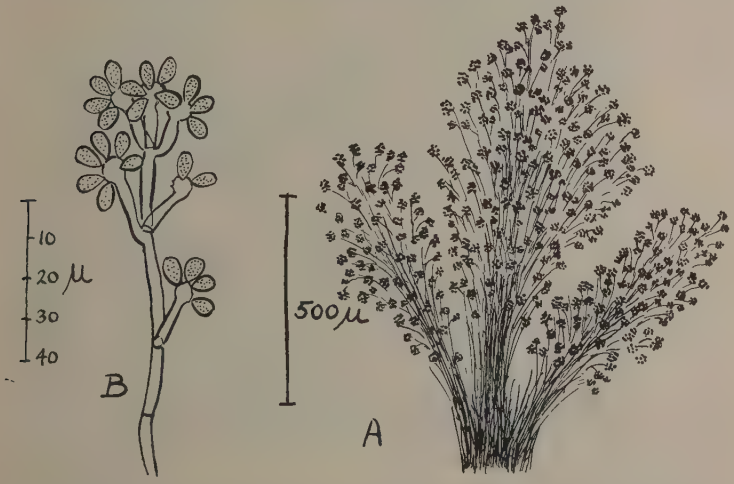


Fig. 2. *Daldinia.* Conidial stage *(Nodulisporium)* in culture on malt agar. A, tuft of conidiophores. B, details of a portion of a conidiophore.

of the bark in the immediate neighbourhood of the stromata. This conidial stage is probably best assigned to *Nodulisporium* (Bayliss Elliott, 1920). It is this same conidial stage which develops when ascospores are sown on nutrient agar in petri dishes (Fig. 2).

A radial section of a fully-grown but newly formed stroma in September shows the perithecial initials as minute spherical bodies (about 100 μ dia.) embedded in the tissue about 250 μ from the edge of the stroma. Each of these consists of a short coiled "Woronin hypha" (ascogonium) surrounded by a sheath of sterile tissue (Fig. 3).

By the end of April or the beginning of May in the following spring the perithecia have fully developed and by this time the stroma has become black and has a very hard outer crust.

The mature perithecium (Fig. 4) is rather elongated with its upper end drawn out into a conical neck, immersed, however, in stromatal tissue, and with its base also prolonged into a small cone.

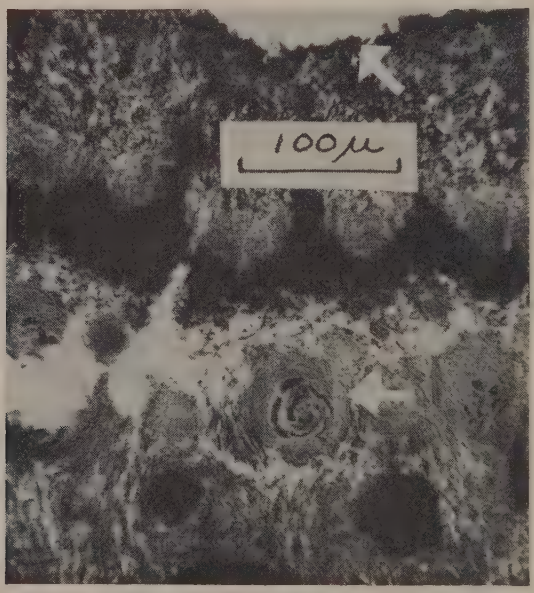


Fig. 3. *Daldinia.* Part near the surface of a section through the stroma. The upper white arrow points to the outer edge of the stroma; the lower to a »Woronin hypha«.

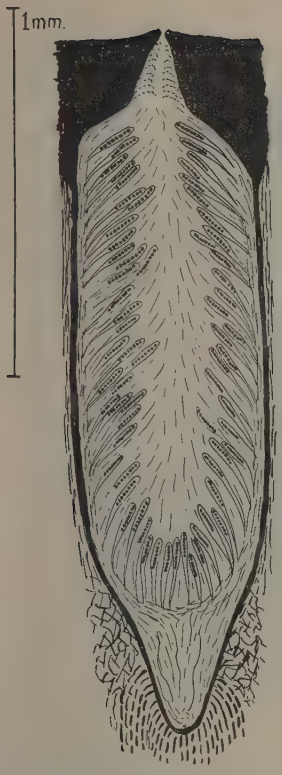


Fig. 4. *Daldinia*. Longitudinal section of perithecium.

In the basal cone the ascogonium is situated but by this time, having lost its dense protoplasmic contents, it is very difficult to see. From it arise long ascogenous hyphae which climb up just within the perithecial wall and produce their asci inwards. These remarkable hyphae can readily be seen if the contents of a single perithecium are dissected out and gently squashed in a drop of water under a coverglass (INGOLD, 1954). Each hypha is really a single cell with its protoplasmic contents largely limited to its apex as in a root hair or a pollen tube. One of these hyphae is shown in Fig. 5, together with a diagram illustrating the method of formation.

It should be emphasized that the asci within the perithecium are not surrounded by air, but are bathed in mucilage. There is no gas phase within an active perithecium. This seems to me an essential feature of any perithecium. This mucilage is the l o c a l reserve upon which the asci rely for their supply of water.

THE METHOD OF SPORE DISCHARGE

Spore discharge in *Daldinia* seems to be of the type most commonly found in *Pyrenomycetes*. It has often been described, for example by BULLER (1922) for *Hypomyces lactifluorum* and by myself in the *Sordariaceae* (INGOLD, 1933). This type may perhaps be illustrated best by such a species as *Pleurage minuta* (Fig. 6) in which observation is easy because of the semi-transparency of the perithecial wall. The interior of the perithecium is filled by asci in various stages of development. These remain firmly attached to a basal cushion. The ripe asci are greatly distended and their upper parts are tightly packed together in the upper region of the perithecium. An ascus, slightly

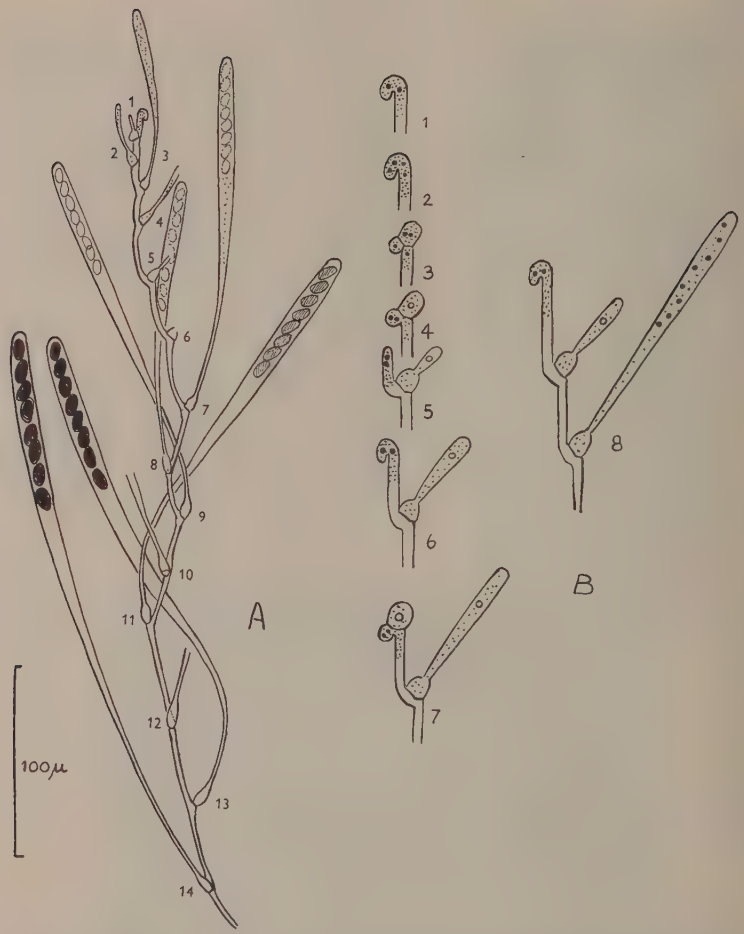


Fig. 5. *Daldinia.* A, portion of an ascogenous hypha from a perithecium; fourteen asci in various stages of development are shown, some have broken off leaving only the stumps. B, diagram of probable mode of development (1—8).

in advance of the others, elongates up the periphyses-lined neck-canal and when its tip emerges explodes squirting its spore-load, roped together in a single mass, to a distance of 10—20 cms. The empty ascus retracts into the perithecium.

In *Cordyceps militaris* the process is essentially the same, but the narrow cylindrical ascus projects to a distance of 50μ before discharge occurs (Fig. 7). Then the long thread-like spores (300×2μ)

Fig. 6. *Pleurage minuta.* Living perithecium mounted in water and shown in optical section. Spores in the mature expanded asci can be seen in the upper part. One leading ascus is just passing up the neck canal. Note the phototropic curvature of the neck. — × 80.

are discharged in strict succession each to a distance of 0.5 mm. and as soon as the last one has been shot away the empty ascus retracts into the perithecium.

In a few *Pyrenomycetes* the course of violent discharge is rather different. Thus in *Ceratostomella ampullasca* and in *Ophiobolus typhae* (INGOLD, 1933 and 1951) the asci when ripe become detached and pass in single file up the neck-canal of the perithecium. When the ascus protrudes beyond the ostiole it bursts to liberate its spores and the empty ascus is pushed out by the next one below; and so the process goes on, often very rapidly.

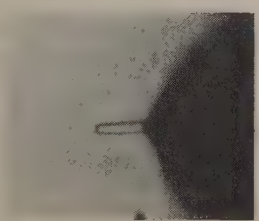


Fig. 7. *Cordyceps militaris.* Conical tip of perithecium projecting from the stroma. The end of a cylindrical ascus is protruding and is about to discharge its spores. — × 165.

In species of *Ophiostoma (Ceratocystis)* there is no violent spore discharge. When mature the walls of the asci break down

while still in the cavity of the perithecium, but the contents of each ascus remain as a separate droplet containing eight spores. These spherical droplets pass in single file up the narrow neck-canal — a canal free from periphyses. Under natural conditions when the droplets emerge they flow together into one large glistening drop of spores supported in position at the end of the hair-like neck by a rosette of ostiolar hairs. (Fig. 8). If a perithecium is mounted in water, instead of projecting into the air, the little eight-spored droplets, instead of flowing together, float out separately into the watery medium (Fig. 9). Again in *Chaetomium,* where the ascus walls break down at maturity, the slimy spore-mass normally oozes out of the perithecium as a sticky mass of spores or as a spore tendril. Spore tendrils are, indeed, also formed by *Daldinia* especially towards the end of the active life of a stroma. However, the method of their formation is not quite like that of *Chaetomium*. An ascus elongates up the neck-canal of the perithecium and then, instead of discharging its spores violently into the air, bursts with only sufficient force to deposit its spores at the ostiole. The next ascus follows addings its load of eight spores behind the first eight. So the process goes on and a spore tendril soon develops. Quite often, however, shortly after a tendril has begun to form, an ascus may burst with sufficient force not only to discharge its own spores but also to carry away the small mass of spores accumulated at the ostiole.

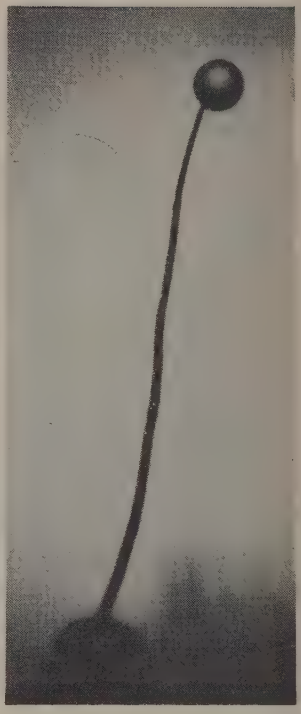


Fig. 8. *Ceratocystis (Ophiostoma)* sp. (isolated from beech) growing on agar. The long black neck rising from the spherical perithecium bears a spore-drop at its apex. — × 60.

THE SPORE DEPOSIT

In *Daldinia* the spores are shot to a distance of 0.3—1.3 cm. If an active stroma is placed on a clean horizontal glass plate

Fig. 9. *Ceratocystis (Ophiostoma)* sp. Apical part of a perithecium mounted in water. The spores are escaping as 8-spored droplets each corresponding to an ascus. In air these all run together to form a single drop.—×375.

and left overnight, there develops around it a black sooty band of spores about 1.3 cm. wide. The only information that this gives is that 1.3 cm. is the maximum distance of discharge. If, however, instead of using a whole stroma, a median slice about 0.5 cm. thick is cut from it and laid on a horizontal glass sheet, there accumulates overnight a spore deposit forming a sooty band about 1.0 cm. wide parallel with the edge of the stroma and separated from it by a more or less spore-free zone about 0.3 cm. wide. Further this band is somewhat zoned with three or four fairly well-defined darker zones parallel with the edge of the stroma (Fig. 10).

If all the asci discharged with equal force and if all the spore projectiles were of the same size, one would expect the spore deposit to take the form of a black l i n e parallel with the margin of the stroma. However, because some variations in spore size and in force of discharge are inevitable, this line would be expected to be somewhat blurred but hardly to the extent of forming a band 1 cm. wide.

The explanation seems to be that the spore projectiles vary in

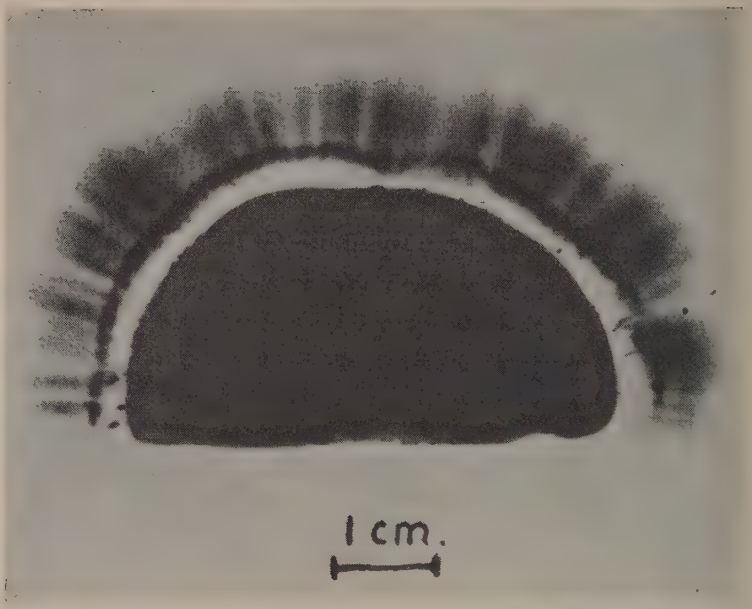


Fig. 10. *Daldinia*. Spore deposit, showing zoning, accumulated overnight around a thick median slice of the stroma lying horizontally on a glass plate.

size from the whole eight spores of the ascus to single spores (INGOLD, 1956). Now the distance (d) to which a minute spherical projectile, shot out with a certain initial velocity, travels is given by $d = Kr^2$, where 'K' is a constant and 'r' is the radius of the projectile. If we consider that the spore projectiles from an ascus may be composed of 1, 2, 3, 4, 5, 6, 7 or 8 spores, and if we assume that these projectiles are spherical, then the relative distances of discharge of these would be given by the square of the cube root of these numbers, supposing that the initial velocity as they leave the ascus is the same. In other words if a projectile consisting of 1 spore was shot to a distance of 1 unit, then a projectile of 8 spores would be shot to a distance of 4 units. Projectiles of intermediate size would be shot to intermediate distances and there would be a tendency for each size of projectile to form its own deposit at a characteristic distance from the edge of the stroma. We would thus get a deposit in the form of a band about three times as wide as the distance separating it from the stroma. Further it would tend to be zoned. In fact the width of the spore

deposit in comparison with the spore-free zone agrees well with theory, and although there are certainly not eight parallel dark zones in the deposit, there are several. Probably not all types of projectile are equally likely, for the various sizes arise by all the spores of an ascus sticking together, or by their breaking up into groups, or by separating completely as individual spores. Microscopic examination of a deposit shows that on its outer edge the spores are in groups of eight, whilst on its inner edge single spores are the rule.

In most *Ascomycetes* where violent discharge occurs the spores either always stick together (e. g. *Ascobolus immersus* and *Pleurage* spp.) or they are discharged so that they escape individually. *Daldinia* is peculiar in this respect. Sometimes the spores stick together; sometimes they do not.

It is to be noted that the output by a stroma is enormous. A medium-sized specimen may liberate 100,000,000 spores in a single night.

WATER-RELATIONS OF SPORE-DISCHARGE

The great majority of the *Pyrenomycetes* that grow on wood and bark are drought-enduring xerophytes. During periods of drought they survive but do not liberate spores. When wetted by rain spore discharge commences, but continues only whilst they remain wet; ceasing very soon when conditions again become dry. *Daldinia* is unusual or perhaps unique in its water-relations (INGOLD, 1946). Spore discharge continues for many days when a stroma is placed under very dry conditions. It seems that the water necessary for discharge is obtained from a reserve in the stroma. If in May or June an active stroma is detached, brought indoors and freely exposed to the dry air of a laboratory, or even placed in a desiccator over anhydrous calcium chloride, spore discharge continues for many days. During this time the stroma shows practically no change in volume, but its density steadily falls. Thus in the three examples recorded in Table I the original density was about 1.0, discharge continued for approximately a month, and at the end of that time the density had decreased to less than a third of its original value. The stromata considered in Table I were gathered after the beginning of spore discharge. In Table II records are given for two stromata which were brought indoors and freely exposed, without any external supply of water, before discharge had started. It will be seen that it was some

Table I

DALDINIA

Isolated stromata in dry room

At start		Period of discharge (days)	At end	
Weight (GMS.)	Density		Weight (GMS.)	Density
26.0	0.96	27	6.1	0.25
34.5	1.01	33	6.9	0.21
24.7	1.02	26	6.8	0.31

days before discharge began but then it continued for over a month relying only on the stromatal water reserve. Spore output was also studied from a stroma attached to an ash-tree in my garden. The arrangement is shown in Fig. 11. Just above the stroma a small wooden roof was arranged, as a protection from rain, and below a

Table II

DALDINIA

Spore discharge period

I. Detached stroma in lab.			
Observations started	Start of discharge	End of discharge	Period of discharge (days)
7 April	17 April	17 May	30
10 April	27 April	23 May	26
II. Stroma on tree trunk			
9 March	3 May	17 Sept.	138

slide-holder in which a glass-slide could be placed to catch the discharge spores. The slide was changed daily from early March to late September. Discharge started on 3rd May and continued nightly until 17th September, a period of 138 days. This longer period of discharge from an attached stroma as compared with detached stromata may well be associated with the gradual replenishment of the water reserve in the stroma from the tree.

It is worth noticing that *Daldinia* is a fungus with a summer dis-

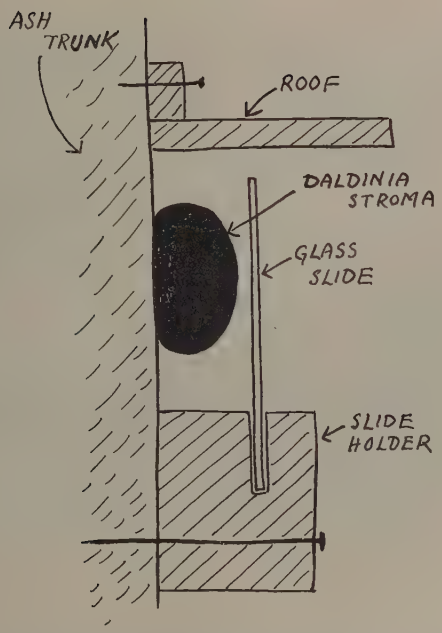


Fig. 11. *Daldinia.* Set-up used in the study of spore discharge from a stroma on a standing tree.

charge period and this is possible because of its curious water-relations. Most other *Pyrenomycetes* (e. g. *Xylaria polymorpha* and *Hypoxylon coccineum)* discharge their spores in the autumn when conditions are more humid.

If the stromatal tissue of *Daldinia* is to be interpreted as essentially a water reservoir, there is the problem of how the water is mobilized and brought to the perithecia. In this connexion it is interesting to note that there is a certain amount of tissue differentiation in the stroma. There is, in addition to the concentric zoning which is responsible for the specific epithet of the fungus, a system of anastomosing veins mostly following a radial course from the point of attachment of the stroma to its periphery (Fig. 12). It is tempting to suggest that this three-dimensional network of veins, like the veins of a leaf, is concerned with the translocation of water, and possibly also of food reserves, to the regions of spore production and discharge — to the perithecia.

NOCTURNAL PERIODICITY OF SPORE DISCHARGE

Whilst investigating the water relations of *Daldinia* it became apparent that spore output occurred mainly during the night. This nocturnal habit was studied in an attempt to determine the factors conditioning this behaviour (INGOLD and COX, 1955).

The apparatus used is shown in Fig. 13. The chassis of a model railway truck was modified to carry the stroma. The truck ran on a short length of rail and was drawn along at a uniform rate by a thread attached to the grooved circumference of a wheel fixed to the axis of a clock. A thread attached to the rear of the truck led by two pulley wheels to a weight. This served merely to steady the truck. A stand carrying a number of glass slides was arranged above the railway so that there was an interval of about 2 mm. between the upper surface of the stroma and the under surface of the slides. Spores were shot onto the slides. The speed of the truck was so adjusted that each slide caught the spore-output from the stroma over a period of two hours. At the end of each day the twelve slides were removed and the apparatus reset. The spores from each slide were washed off in water and their number estimated using a haemacytometer. The whole apparatus was contained in a glass-topped incubator at constant temperature and the fungus was illuminated from above by four fluorescent tubes, or darkened as required. For each experiment a separate stroma was used.

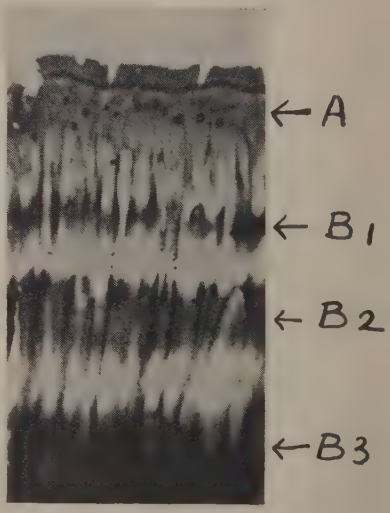


Fig. 12. *Daldinia*. Small part of median section of stroma gathered in September. A, region of ascogonia; B_1, B_2, B_3 concentric bands of thick-walled hyphae. Note the veins following a radial course. — × 15.

The results of two experiments are illustrated in Fig 14. It will be seen that in continuous darkness the periodicity of discharge is maintained for about 12 days, but after that, although definite periodicity dies out,

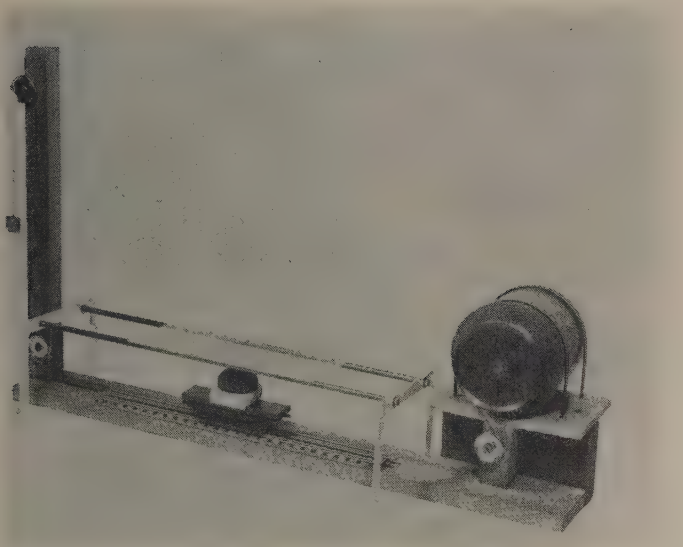


Fig. 13. Spore discharge apparatus. For explanation see text.

spore discharge continues. On return to the conditions involving 12 hours of darkness followed by 12 hours of light in each day, the periodicity is at once re-established. Similarly in continuous light the periodicity is maintained for a few days, but not nearly so long as in continuous darkness. Again, in this case, the return of periodic conditions at once brings back the periodicity of spore discharge.

These experiments suggest clearly that the periodicity of discharge in this fungus is conditioned by the changes in illumination involved in the alternation of day and night. The problem of the persistant rhythms of discharge after conditions have ceased to be periodic takes us into the realms of cell physiology. Suffice it to say that there are many examples of organisms with "internal clocks" and the mechanism of these is in great need of investigation.

Periodicity of spore discharge is by no means limited to *Daldinia*. In most other *Pyrenomycetes* I have studied spore discharge is periodic. *Hypoxylon coccineum* and *Melanomma pulvis-pyrius* agree with *Daldinia* in being essentially nocturnal, but *Nectria cinnabarina* and *Pleurage curvula* are diurnal.

This study of spore discharge in *Pyrenomycetes* with special

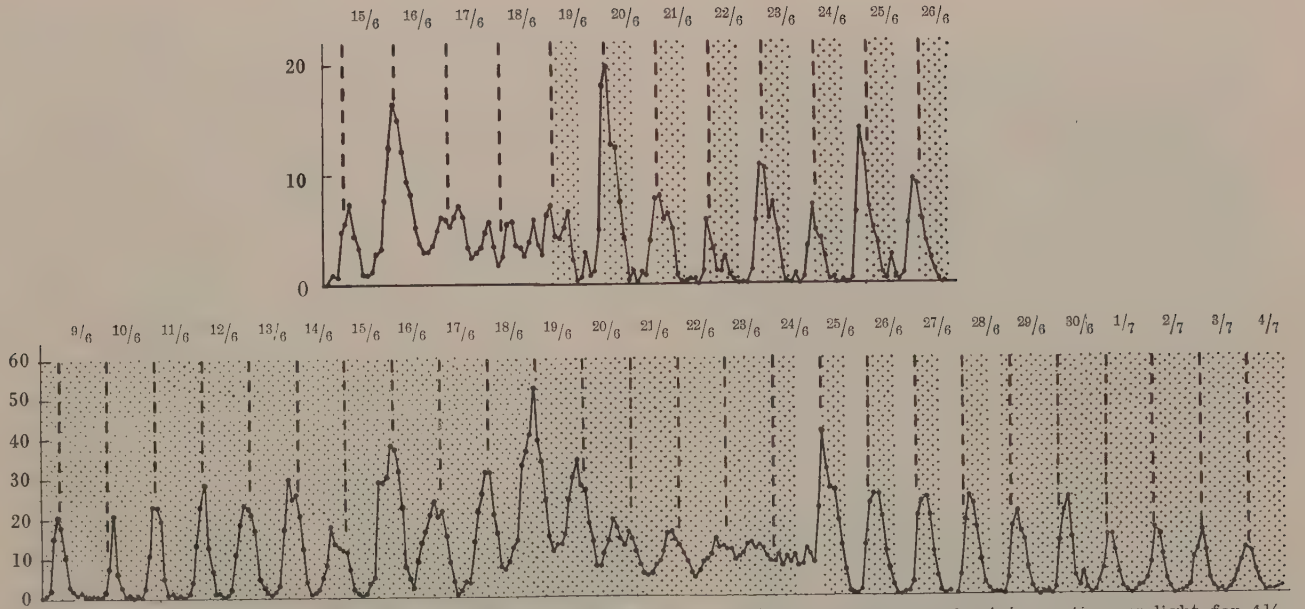


Fig. 14. Upper graph: rate of spore discharge plotted against time for a stroma kept in continuous light for 4½ days and thereafter placed under conditions of 12 hours light and 12 hours darkness in each day. — Lower graph: rate of discharge for another stroma kept in continuous darkness for 16 days, then placed under conditions of 12 hours light and 12 hours darkness in each day for 4½ days, then returned to darkness for 6 days. — Temperature was constant at 21° C. and, during light periods, the illumination was approximately 100 footcandles. — Dotted regions indicate periods of darkness. Vertical interrupted lines show the position of midnight. — To convert the rate of discharge into number of spores trapped in each 2-hour period, it is necessary to multiply the figures on the graph by 100.000.

reference to *Daldinia concentrica* illustrates my essential interest in Fungi — an interest in Fungi as living mechanisms. I would be the last to underestimate the value of taxonomy, but there are other aspects of Mycology and I believe that much is to be learnt from an intensive study of the biology of individual species.

REFERENCES

Buller, A. H. R.: Researches on Fungi. Vol. II. London. 1922.

Elliott, J. S. B.: On the formation of conidia and the growth of the stroma of *Daldinia concentrica*. — Trans. Brit. mycol. Soc. 6: 269-273, 1920.

Ingold, C. T.: Spore discharge in Ascomycetes. I. Pyrenomycetes. — New Phyt. 32: 175-196. 1933.

— : Spore discharge in *Daldinia concentrica*. — Trans. Brit. mycol. Soc. 29: 43-51. 1946.

— : Aquatic Ascomycetes: *Ceriospora caudae-suis* n. sp. & *Ophiobolus typhae*. — Trans. Brit. mycol. Soc. 34: 210-215. 1951.

— : The ascogenous hyphae in *Daldinia*. — Trans. Brit. mycol. Soc. 37: 108-110. 1954.

— : The spore deposit of *Daldinia*. — Trans. Brit. mycol. Soc. in the press. 1956.

Ingold, C. T. & Cox, V. J.: Periodicity of spore discharge in *Daldinia*. — Ann. Bot. N. S. 19: 201-209. 1955.

FRIESIA . Bind VI . Hefte 3 . 1959

L'OBSERVATION AU MICROSCOPE ELECTRONIQUE DES STRUCTURES FINES DES MYXOMYCETES

Par MARCEL LOCQUIN

Laboratoire de Cryptogamie du Museum, Paris.

Exposé fait à la séance du cinquantiéme anniversaire de la Société Mycologique du Danemark, le 3 octobre 1955.

L'évolution de la microscopie électronique est toute entière tendue vers la réalisation d'un pouvoir séparateur de plus en plus poussé.

Parallèlement pour exploiter ce pouvoir séparateur on a mis au point des techniques de coupes minces qui comme en microscopie classique permettent avec beaucoup de peine la reconstruction des trois dimensions d'un objet. Mais cette voie n'est pas la seule possible. Il existe au moins deux directions dans lesquelles l'observation au microscope électronique peut présenter un grand intérêt : l'observation d'objets vivants et l'observation d'objet épais.

Nous n'entrerons pas ici dans le cadre des détails de l'analyse des possibilités qu'offre le microscope électronique pour l'examen des objets vivants pour nous consacrer uniquement à montrer par quelques exemples empruntés à l'étude des structures capillitiales des myxomycètes comment cet appareil peut rendre service dans l'observation des structures relativement épaisses c'est-à-dire dont l'ordre de grandeur dépasse le micron. A condition de disposer d'un microscope électronique dont la tension d'accélération soit d'au moins 100 kv. et de prendre un soin tout particulier au réglage de l'éclairage en calquant celui-ci sur les principes classiquement admis en optique ordinaire, on peut facilement obtenir des images nettes d'objets ayant des dimensions supérieures au micron. Cependant, ces images sont en général vidées de tous détails. En effet, la totalité de l'objet est formée principalement d'atomes de carbone et les contrastes entre les

différents constituants ne viennent que du plus ou moins grand degré de condensation de ces atomes de carbone. Il faut donc avoir recours à certains artifices pour obtenir une augmentation des contrastes rendant perceptibles ces détails.

La première méthode que nous avons utilisée est celle des *imprégnations sélectives*. Certains colorants possédant dans leurs molécules des atomes lourds par exemple iode, mercure, fer, etc. s'ils ont une affinité élective pour telle ou telle partie de l'objet se comporteront comme des modificateurs de contrastes ou improprement des „colorants" pour microscopie électronique.

Dans le cas des objets qui nous intéressent, seule l'iode sous forme de vapeur et dans certains cas le chlorure de ruthénium (ou rouge de ruthénium) peuvent convenir. On a toujours avantage à opérer ainsi pour imprégner à l'iode : dans le fond d'un tube à essai on place quelques cristaux d'iode et la préparation une fois en place sur le porte objet du microscope électronique est légèrement humectée à la vapeur d'eau puis plongée dans les vapeurs d'iode pendant quelques secondes, celles-ci étant obtenues par chauffage des cristaux d'iode sur la veilleuse d'un bec Bunsen. Après quelques secondes de dessiccation dans une cloche à vide l'objet est prêt à être examiné.

La deuxième méthode est celle du *constraste de phase* et du *contraste interchromatique*.

Ces deux méthodes que nous avons mises au point nécessitent un microscope électronique spécial et pour tirer tout le parti que l'on peut en attendre il est nécessaire d'examiner les objets sans film support. Ceci est particulièrement facile quand il s'agit de fibres capillitiales de myxomycètes qui peuvent être placées à cheval sur la fente porte objet ou les trous porte objet, pressées entre deux porte objets identiques.

L'utilisation combinée de ces deux procédés nous a permis de faire quelques constatations intéressantes dans le domaine des structures fines des myxomycètes. Tout d'abord les structures hélicoïdales des *Trichiacées* se présentent comme des rubans de poids moléculaire plus élevé que le reste de la fibre et présentent souvent à leur surface une orientation moléculaire palissadique absolument régulière. Lorsque les spirales sont naturellement irrégulières la nature des spirales majeures et des spirales mineures est la même. Mais l'étude de la structure interne de ces fibres est difficile sur cliché positif étant donné que le négatif obtenu dans ces conditions particulières de contraste interchromatique présente un intervalle de densité trop fort pour être aisément copiable sur papier. Nous avons donc été conduits

à mettre au point une technique de transposition en couleurs des contrastes du négatif qui a l'avantage d'une part de permettre de copier sur le positif des intervalles de densité triples de ceux copiables sur un positif noir et blanc, d'autre part de transposer directement en couleurs les différentes tranches de densité du négatif donc en dernier ressort les différents niveaux de poids moléculaire de l'objet. Cette méthode mise au point avec MM. MOLINAT et WEBER a évidemment l'inconvénient d'être longue et délicate mais peut-être sera-t-il possible dans un avenir prochain d'effectuer la prise de vue en couleurs directement dans le corps du microscope électronique.

Nous avons rassemblé sur une planche quelques exemples de ces méthodes d'observation appliquées à l'étude des structures des capillitium de myxomycètes.

Fig. 1. Détail de la surface de la spore de *Brefeldia maxima*.
Grossissement 20.000 — Fond clair — 80 kv.

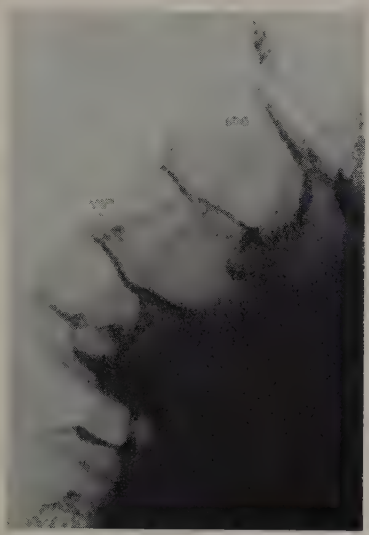


Fig. 2. Détail de la surface de la spore de *Hemitrichia clavata*.
Grossissement 20.000 — Fond clair — 80 kv.

Fig. 3. Capillitium d'*Hemitrichia Karstenii*.
Grossissement 40.000 — Fond clair — 100 kv.
On voit que le détail des spirales internes est peu visible.

Fig. 4. Capillitium de *Prototrichia Schroeteri*.
Grossissement 20.000 — Contraste interchromatique.
On voit que le détail des spirales internes est très visible.

Fig. 1. Capillitium d'*Hemitrichia abietina*.
Grossissement 18.000 — Contraste interchromatique.

Fig. 2. Capillitium d'*Hemitrichia Karstenii*.
Grossissement 23.000 — Contraste interchromatique.

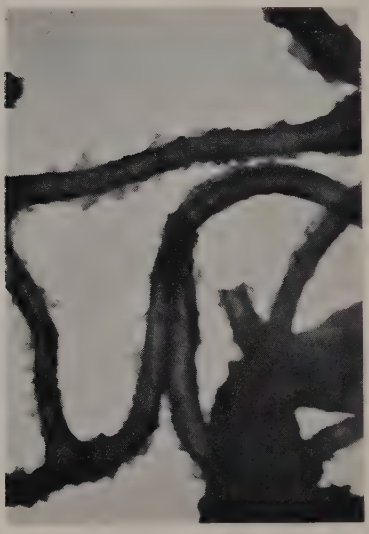


Fig. 3. Capillitium de *Lamproderma arcyrionema*.
Fond clair — 40 kv. — Grossissement 8.000.

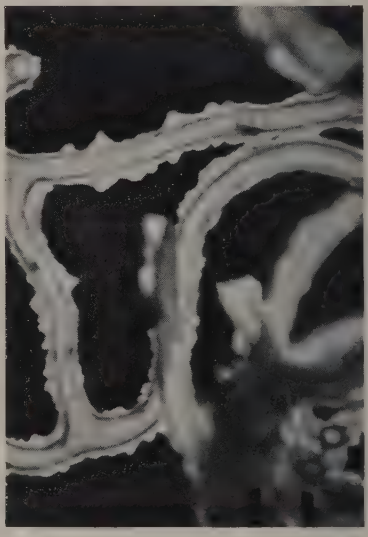


Fig. 4. Capillitium de *Lamproderma arcyrionema*.
100 kv. — Contraste de phase — Grossissement 8.000.
Les ornements superficiels du capillitium sont nettement visibles et la forme tubulaire creuse de celui-ci est beaucoup plus évidente que sur la figure précédente.

FRIESIA . Bind VI . Hefte 3 . 1959

THE MYCOFLORISTICAL EXPLORATION OF SCANDINAVIA, ESPECIALLY SWEDEN

By J. A. NANNFELDT

Universitetets Institution för Systematisk Botanik, Uppsala.

Lecture at the Scientific Session of the Jubilee Meeting of the Danish Mycological Society, Copenhagen, 3 October 1955.

When I was honoured by an invitation to read a paper at this Jubilee, I felt it might not be out of place to select a more or less historical theme. For decennia, I have been interested in the exploration of the Scandinavian flora, and I thought it might be of some interest to review the present state of our mycofloristical knowledge. As my paper must be concentrated, it will be rather fragmentary. I apologize that I shall treat the most important agaricological contributions of numerous Danish mycologists very briefly. Most of them will be passed over in silence. But they are so closely connected with our Society that they are well-known to all of us. It should also be kept in mind that I am treating only the mycofloristical aspects and that no taxonomical, developmental or experimental studies are mentioned unless they have some bearing upon our special theme. Nevertheless, there are certainly numerous unintentional omissions in this paper.

Scandinavia, esp. Sweden, was once that part of the world best known floristically. In 1845, ELIAS FRIES published the first part of his "Summa Vegetabilium Scandinaviae" with the *Cormophytes, Algae* and *Lichens,* and four years later the second part followed with the *Fungi.* We had thereby got a complete list of what was known at that time about the composition of the Scandinavian flora.

FRIES's "Summa" was not the first enumeration of the Swedish or Scandinavian flora, but it has remained the latest complete. In 1940 a Swedish zoologist, Prof. T. GISLÉN of Lund, published an estimation

of the number of Animal species in Sweden. At that time ca. 24,150 Animal species*) were known from Sweden, amongst them 910 Protozoa, 17,290 Insects and 640 Vertebrates. He estimated that at least 6000 remained to be discovered, amongst them at least 2000 Protozoa and as many Insects. The Animal species of Sweden should thus number ca. 30,000.

The number of Plant species is certainly lower, just as the total number of Plants is lower than that of Animals. For the centennial day of FRIES's "Summa" I tried to make a similar calculation of the number of Plant species known from Scandinavia, but I refrained from any attempt to estimate the number that remains to be discovered. I shall here cite some of my figures showing how the number of species has gradually increased

	Vasc. Pl.	Mosses	Algae	Lichens	Fungi	Total
1745 (LINNAEUS, FL. SUECICA, ed. I) ...	863	72	92		99	1128
1755 (LINNAEUS, FL. SUECICA, ed. II)...	958	98	135		101	1292
1779 (RETZIUS, PRODROMUS, ed. I)	1178	135	213		121	1647
1795 (RETZIUS, PRODROMUS, ed. II)	1312	172	327		212	2023
1849 (FRIES, S.V.Sc.)	1740	615	324	397	3746	6822
1949 (NANNFELDT) .	1891	1113	4400	2012	7250	17000

It is only natural that during the last century the increase has been rather small for *Vascular Plants*. The future increase will certainly be still smaller. A Vascular Plant new to Scandinavia is more or less a botanical sensation, except in apomictic groups. But in my calculations, apomictic microspecies have been brought together into groups, in scope comparable to the amphimictic so-called "Linnaean" species. — The number of *Mosses* has almost doubled during the same period. The reason is easy to understand — more intense collecting and a narrower and sharper delimitation of the species thanks to the more frequent use of the microscope. The number will certainly continue to increase, but less rapidly. — The number of

*) It should be observed that GISLÉN included the *Myxomycetes* (= *Mycetozoa)* amongst the Animals *(Protozoa)*.

Lichens has more than quintupled. The main increase falls upon the crustose Lichens, which cannot be treated satisfactorily without the constant use of the microscope. The number of Lichens is still increasing rather rapidly, and several groups of them are in strong need of taxonomical revisions. — The number of *Algae* has increased more than tenfold, but the unicellular Algae, such as Diatoms, Desmids and numerous others, were a world totally unknown to FRIES. New species, esp. of the microscopical Algae, are constantly added to our flora, and amongst the most delicate forms there are evidently numerous that have still escaped the notice of all algologists. — The number of *Fungi* (excl. of the *Lichens)* has not fully doubled. This relatively small increase sounds rather strange. But on one hand the larger Fungi (esp. the *Agarics* and *Polypores)* were already a century ago very well-known thanks to FRIES. Relatively few have been added to our flora, and not few older species found on single occasions have been reduced to synonymy. The microscopical Fungi, on the other hand, have on the whole been unduly neglected by later Scandinavian botanists, and one of their subgroups, the *Pyrenomycetes* (in the old broad sense) was studied intensely by the young FRIES, who distinguished an astonishingly large number without resorting to microscopical characters. Several of them, too, have later been relegated into synonymy, which means a decrease in number.

It would certainly be interesting to compare figures for various subgroups of *Fungi.* But this is almost impossible as the classification has changed so much and is still far from fixed. Moreover, within all groups of mainly parasitic Fungi it is at the moment very difficult to give exact numbers as the species concept is so variable. Three or four decennia ago, uredinologists and ustilaginologists advocated a very narrow species concept based mainly on host specialization and on biometry. This splitting went too far. The discovery of sexuality, with the possibility of hybridization and recombination, led back to a wider and mainly morphological species concept. In the hands of many uncritical mycologists the biometrical methods became badly misused.

With these reservations, figures for some of the subgroups will be mentioned.

A century ago, E. FRIES knew 1243 Scandinavian *Agarics.* The recent number amounts to about 1600. For comparison, it may be mentioned that a recent British list (PEARSON & DENNIS 1948) gives 1234 species for the British Isles. The number of Agarics will certainly

increase a good deal, even if such events are not repeated too often as the pulverization of the few old species of *Psalliota,* MØLLER's imposing monograph (1950-51) showing Denmark to possess about 50 species. There are some genera, in which careful microscopical studies have led to a multiplication of the number of species, and, in spite of J. E. LANGE's pioneer work much remains to be done in Scandinavia. I have such genera as *Mycena, Galera, Inocybe, Entoloma* and its allies in mind. — The *Rusts* number in FRIES 133 species, but their complex life-cycles were not known at that time, and so aecidial, uredinial and telial states were counted separately. His number should thus be reduced considerably. In 1949, I estimated the recent number to be 400 species following the narrow physiological species concept. After that, JØRSTAD, with the assistance of HYLANDER (1953) and myself, has compiled a check-list of the Scandinavian Rusts using a broad morphological species concept. The number then sank to 264. Scandinavia is very well-known, and the future additions will probably be rather few. — In FRIES, the *Smuts* number 14 species. In 1949, I estimated the number to be about 250 with the narrow species concept of LIRO, but with a concept comparable to that in JØRSTAD's list their number will sink to about 175. The Scandinavian Smuts are on the whole well-known, but there evidently remain a lot of species to be discovered.

The increase of the number of species depends partly upon a closer exploration of the area, partly upon taxonomical progress. And this progress in its turn is to a high degree connected with refined methods and refined technique. The general use of the microscope meant a revolution in the study of the Fungi, but it led also to an over-estimation of such easily observable characters as size and shape of spores, asci and basidia and to a regrettable neglect of other characters. Successively it was felt that it was not sufficient to study crude crush preparations and that thin cuts were needed for a full understanding of the inner structures. Before the introduction of the freezing microtome technique, it was so time-consuming to get such preparations that they could not be utilized to the extent desired. The use of chemical reagents (introduced into Mycology from Lichenology) is also a modern taxonomical tool of great importance e.g. in the study of *Discomycetes* and *Agarics*. But like many other tools this c a n be and h a s been badly misused by uncritical students. For the study of micromycetes, the binocular dissecting microscope means a new tool, the value of which cannot be overestimated. — Especially

for the parasitic fungi the use of cultures and infection experiments has deepened our knowledge enormously.

In the preceding I have given some facts concerning the number of species known in Scandinavia as a whole. These figures reflect roughly the intensity with which mycofloristical studies have been undertaken, but they do not tell anything about the areas of these studies nor about our knowledge of the distribution of the Fungi within Scandinavia. As the interests of the individual mycologists as a rule cover only part of the Fungi, a certain area may be very well investigated with regard to one group and yet remain a "white spot" with regard to others. We shall thus have to treat our theme group for group. But the groups to be used here are not taxonomical groups, but groups created by the interests of the individual mycologists and such taxonomically irrelevant factors as the mode of collecting, determining and preserving. The groups will not be logical, for the interests of human beings can hardly be arranged according to any logical principles.

I shall treat my theme under the following six headings:

(1) the larger, terricolous, mainly fleshy fungi,
(2) the larger, lignicolous, mainly tough fungi,
(3) the parasitical microfungi,
(4) the saprophytical microfungi,
(5) the hypogaeous fungi,
(6) the aquatic (lacustrine and marine) fungi.

Some groups, such as fimicolous fungi and carbonicolous fungi will be passed over in total silence. Time does not allow me here to treat more than the first two groups fully.

1. THE LARGER, TERRICOLOUS, MAINLY FLESHY FUNGI

My first group, the larger, terricolous, mainly fleshy fungi, includes first and foremost the *Agaricales*, i.e. the *Agarics* (mushrooms and toadstools) and the *Boleti*. Several other groups of *Basidiomycetes* enter also the stage such as the stipitate *Hydna, Clavariae, Cantharellus* and allies as well as the epigaeous *Gastromycetes*.

The actual founder of their taxonomy is Elias Fries and, as already mentioned, the majority of the Scandinavian species were known to him. But the areas investigated by him were necessarily very restricted. They were mainly Femsjö, his birth-place in S.W.

Småland, and the surroundings of the university-towns of Lund (Skåne) and Uppsala (Uppland). The fungi known to him from Femsjö about 1825 were listed in his "Stirpes Agri Femsionensis", in which the *Agarics* number ca. 500. A pupil of his, the young Norwegian botanist N. LUND, published in 1846 a "Conspectus" of the *Hymenomycetes* of the Stockholm region (based mainly on one autumn's excursions). Otherwise FRIES was very uninterested in giving exact localities for plants. In his "Botaniska utflygter" (1853, p. 88) he declares that the fact that excursion reports, plant lists from special localities and similar publications are considered as important contributions to Plant Geography gives a show of ridicule and futility to that science. He continues:

"Nya växtorter inom en växts kända utbredningszon äro oftast något tillfälligt och sprida lika litet ljus öfver Växtgeografien som upptecknandet af nya torpstugor och gärdesgårdar i ett bebyggt land öfver allmänna Geografien. Växtgeografiens uppgift är fastställandet af allmänna lagar för växternas utbredning och, i det speciella, vilkoren och till följd däraf äfven gränserna för de enskilda arternas trefnad; men icke utvidgar det Växtgeografien, om den eller den arten växer i någon viss socken eller dike."*).

It is not clear, however, how FRIES thought it possible to establish the "natural area" of a species without access to specified exact localities. Now, a century later, after intense studies, we know the distributions of our *Vascular Plants* so well, that with a certain amount of confidence we can state their areas and begin to discuss what factors govern them. But as to the *Fungi* we are still in the period of collecting facts, and material is available from relatively small areas.

Studies on the distribution of the *Agarics* meet two difficulties that are only to a lesser degree met in other groups. One is that the fruit bodies are very ephemeral and do not appear at all in unfavourable years. Even most intense and careful studies restricted to one year may thus fail to yield very common and characteristic species.

*) New localities within the known area of a species are as a rule something fortuitous and throw as little light upon Plant Geography as the listing of new huts and fences within an inhabited country throws light upon General Geography. The aim of Plant Geography is the establishing of general laws for the distribution of plants and, in special cases, the conditions for and, as a consequence, also the limits of the thriving of the individual species. By no means does it extend Plant Geography if species so-and-so grows in a specified parish or ditch.

The other difficulty is the scarcity of herbarium material. The number of publications with exact localities is necessarily low, and FRIES's contempt of such papers certainly did not stimulate such studies. The published localities cannot be made use of fully, as the determinations can not be verified due to the lack of preserved samples.

The *Agarics* are difficult to preserve. It is very difficult and tedious to get good herbarium specimens that show the colours, and they should always be accompanied by detailed notes on colours and other characters that are liable to change or to be lost on drying. Formerly, when the taxonomy was based exclusively on shape, colour, taste, odour and other external characters, it was only natural that herbarium specimens of *Agarics* were considered almost valueless. It is more surprising that the same opinion is still held by some few otherwise modern agaricologists who use microscopical characters that do not change — or change only inconsiderably — on drying. Even if they do not succeed in getting perfect herbarium specimens, their harvest would certainly fulfill its purpose better in the herbarium than in the waste-basket. Had the fathers of mycology been far-seeing enough to preserve their specimens, the voluminous and unproductive discussions on the correct application of the old names would have been unnecessary. Also the mycofloristics would have had a much broader and safer base.

At present the distribution of the *Agarics* is better known within Denmark than within the other Scandinavian countries. It is true that Denmark has a much smaller area, but the intensity of the exploration has been and still is much higher. There have been and still are a large number of out-standing agaricologists in this country, and not least thanks to our Society, its forays and its periodicals, all parts of the country have been studied and the more interesting finds published. It is a pity that up to very recently only few specimens have been preserved. Even the most beautiful and true colour-plates and the most detailed descriptions cannot be equivalent to actual specimens, for nobody can foresee what characters will eventually be found to be the deciding ones.

The Swedish mycofloristical papers on *Agarics* are very few in number. The lists from Femsjö (E. FRIES 1825-27)*) and Stockholm (N. LUND 1846) have already been mentioned. Species from Skåne have been reported in several publications (e.g. BÜLOW 1889; ANDERS-

*) An important supplement to this, written by E. FRIES in 1854 for the use of M.A. LINDBLAD was published by LUNDELL (1936).

SON 1939, 1940, 1941, 1942; JOHN ERIKSSON 1948); the *Agarics* in the area round Göteborg have been treated by e.g. THEORIN (1879), O. ROB. FRIES (1888, 1900) and NATHORST-WINDAHL (1943, 1945, 1949). Some genera of *Agarics* from the Karlstad area (Värmland) have been treated by SVENSSON (1940, 1944, 1950). Rare species from Uppsala have been published by e.g. O. ROB. FRIES (1907) and LUNDELL (1937), a list of the species growing in "Vårdsätra naturpark" (close to Uppsala) by LUNDELL (1934) and one from Älvkarleby (North Uppland) by FÅHRAEUS & STENLID (1954). Lists from the Falun area (Dalecarlia) were published by THEORIN (1880, 1892). From the north of Sweden there are only the papers by HENNING (1885, 1887) on Western Härjedalen, the partial lists from Abisko by ROMELL (1911), M. LANGE (1946) and PILÁT & NANNFELDT (1954) as well as the list from Karesuando (both in Torne Lappmark) by LAESTADIUS (1860).

HAMPUS VON POST (* 1822, † 1911), a pupil of ELIAS FRIES and polyhistor, perhaps most famous as one of the discoverers of the quaternary glaciations in Scandinavia, was the first Swede to preserve *Agarics* on a larger scale. His specimens are now in Naturhistoriska Riksmuseet, Stockholm, but they are as a rule very fragmentary and not too well preserved. They originate mainly from Reijmyra (Östergötland) and Uppsala. — LARS ROMELL (* 1834, † 1927) preserved consistently all his mycological finds. His very large and valuable collections are now in the Stockholm museum. They are mostly from the Stockholm area, but other parts of the country are represented too, esp. Femsjö and Torne Lappmark. SCHÄFFER (1939) has published a revision of the genus *Russula* in Sweden, based mainly on his collection. His material of several other genera has been used by e.g. PILÁT (1935, 1946, 1948) and SINGER & SMITH (1947).

SETH LUNDELL in Uppsala has devoted his life to elucidating the true sense of the Friesian species. To that purpose he has studied especially the Uppsala and Femsjö areas and prepared his finds with a skill probably unsurpassed. His scientific results are continously published in an exsiccatum edited by him and me (LUNDELL & NANNFELDT 1934-). On the labels, notes are often given about the distributions within Sweden. His studies have also covered other parts of Sweden (e.g. Blekinge and Södermanland), and through his correspondents the Uppsala museum has received rich collections from various parts, e.g. Gotland (E. TH. FRIES, B. PETTERSSON a.o.), Blekinge (S. WIKLAND), Nässjö (Småland, G. HAGLUND), Göteborg (T.

NATHORST-WINDAHL, F. KARLWALL a.o.), Uddevalla (Bohuslän, S. WOLDMAR), Sala (Västmanland, R. MORANDER), Sollefteå (Ångermanland, W. GRANLUND), Över-Torneå (Norrbotten, O. LÖNNQVIST).

Under the auspices of "Botaniska sällskapet" G. HAGLUND and his collaborators (R. RYDBERG, N. SUBER a.o.) have begun to inventory the Stockholm area mycologically. It is to be hoped that in spite of Dr. HAGLUND's premature and lamentable death this summer (1955) his work will be continued. Also the Stockholm museum is receiving material from various parts of the country.

In N o r w a y, AXEL BLYTT (1905) summarized the little that was known about the *Hymenomycetes* up to his death in 1898. In the following decennia the larger fleshy fungi have been very much neglected by both professional botanists and amateurs, but Norway now possesses a number of interested and eager students (STORDAL e.g. 1952, 1953, 1954 a & b, 1955 a & b; F.-E. ECKBLAD a.o.). In 1954, a Norwegian mycological society was organized. Previously local societies had existed for shorter or longer periods.

In F i n l a n d the Mustiala area (Tavastia australis) is well-known through the work of P. A. KARSTEN. Different parts of South Finland have been investigated by various students (e.g. V. SCHULMANN 1955). The Åland archipelago has been studied by e.g. FREY (1944) and STENLID (1947), the archipelago of S.W. Finland by EKLUND (1943, 1944) and the mainland of South Finland, esp. the Helsingfors area, by numerous students (e.g. MALMSTRÖM 1933, 1943, 1946; NYBERG 1934, 1937, 1943, 1946). The studies by THESLEFF (1920) from a more ecological point of view are worth special mention. In a book devoted to the "mushroom crop in Finland and its utilization" RAUTAVAARA (1947) gives a list of all larger fungi recorded from Finland and for most of them he tries also to give their frequency and occurrence within five zones from the south to the north. The list is, however, very uncritical and the distributions are based on too meagre facts to be reliable. There are in Finland for the present a number of eager and interested students, e.g. TUOMIKOSKI (1953 a & b), and in 1948, a Finnish mycological society was founded, publishing a periodical ("Karstenia"). As will be understood from the preceeding, large parts of Scandinavia, especially in the North, are still totally unknown as to their *Agarics*.

It has been known since olden times that certain *Agarics* (and other terricolous fungi) grow only in close connection with a certain woody plant or certain woody plants. Now that the phenomenon of

mycorrhiza formation has been investigated in detail by ELIAS MELIN and his pupils, the reason is clear. Just as a smut or a rust cannot occur outside the area of its host or hosts but need not necessarily occur within all parts of that area, in the same way the area of a mycorrhiza forming fungus need not coincide with the area of its symbiont (or the combined area of its symbionts). In other words it need not be "homotopic" to use an expression introduced by ARWIDSSON (1938).

It stands out clearly that there are phytogeographical groups of the larger Fungi comparable to those of higher plants. There are southern species, having their limits in South or Central Sweden, e.g. the lignicolous *Schizophyllum commune* (which, evidently, in the last decennia has expanded its area considerably, comp. ANDERSSON 1945) and the terricolous *Amanita phalloides,* several species of e.g. *Boletus* (ANDERSSON 1943) and *Inocybe* as well as *Asterophora parasitica* (WOLDMAR 1954). The phanerogamic flora of the Baltic calciferous islands of Öland and Gotland possess numerous southern species and in several cases these areas are very isolated. The Agaric flora of Gotland contains evidently several remarkable species of a similar distribution, such as *Lactarius sanguifluus.* In the northern parts of Sweden, numerous species seem to have their polar limits or become at least much rarer. Such conspicuous and unmistakable species as *Amanita virosa, Pholiota aurea, Armillaria focalis, A. imperialis,* and *A. Goliath* have not been observed north of Sollefteå (Ångermanland). Here intense investigations are badly needed. — There is also a certain, though much smaller, number of species that have south limits in Scandinavia. Two examples may be picked out from the list by PILÁT & NANNFELDT (1954), viz. *Omphalia luteovitellina* and *Stropharia magnivelaris.* — There are clearly western species, such as *Boletus parasiticus,* parasitical on *Scleroderma aurantium* which host has a much wider distribution. — There are certainly eastern species although it is difficult to give examples as West Sweden is far less known than the eastern parts. — There are species restricted to or clearly preferring our calcareous areas etc.

As to the terrestrial *Gastromycetes* (stinkhorns, puffballs etc.) the geographical knowledge is slightly better. The puff-balls are easily known and they are not difficult to collect and preserve. Numerous botanists besides exclusive mycologists have collected them. TH. C. E. FRIES, a grandson of ELIAS FRIES, already in 1921 found it possible to give the main features of their Swedish distributions.

Already in 1918 he had treated the *Gastromycetes* of the province of Troms (north Norway). For most species the picture has changed very little since then, but additions have been published by i.a. ANDERSSON (1941, 1942, 1950 a & b), ARWIDSSON (1936c, 1946a), HERTZ (1947), MÖRNER (1937, 1939), RYDBERG (1949), SANDBERG (1940) and SKOTTSBERG (1936). The majority of the species are southern, and several reach their polar limits in South or Central Sweden, e.g. *Mutinus caninus, Phallus impudicus, Calvatia gigantea, Lycoperdon echinatum* and *L. pratense,* as well as most species of *Geaster.* A few species are northern, e.g. *Calvatia cretacea* and *Bovista cretacea.* Much research remains before we can get a more detailed picture. We need also careful taxonomical revisions of several genera. — In Denmark and Norway the *Gastromycetes* are for the present studied by MORTEN LANGE (e.g. 1950) and F.-E. ECKBLAD (e.g. 1951, 1952, 1954; ECKBLAD & WISCHMANN 1953) respectively.

The larger terricolous *Discomycetes,* i.e. almost all *Operculates* and the family *Geoglossaceae* of the *Inoperculates,* fall also under this heading. Few species are really common, and few mycologists have been interested in them. The *Geoglossaceae* are better known taxonomically than any other group of *Ascomycetes,* and there remain certainly few species to be added to the Scandinavian flora. The Norwegian species have been treated by IMAI (1940), the Swedish by the author (NANNFELDT 1942 a) and the Danish recently by BILLE-HANSEN (1954). — The taxonomy of the *Operculates* is still most chaotic. Numerous species remain to be discovered in Scandinavia. The *Sarcoscyphaceae* as well as some other species have been studied by the writer (NANNFELDT 1937, 1938, 1949). Most parts of Scandinavia are totally unexplored. It seems likely that the majority of the species possess polar limits with us and that there are a few restricted to the northern parts and to the mountains, e.g. *Helvella arctica.* A number of species are clearly calcicolous, e.g. *Helvella leucomelas* and *Sarcosphaera Dargelasii.*

2. THE LARGER, LIGNICOLOUS, MAINLY TOUGH FUNGI

We turn now to our second heading, the larger, lignicolous and mainly tough fungi, which group taxonomically corresponds roughly to the *Homobasidiomycetes-Aphyllophorales,* but also the *Heterobasidiomycetes-Tremellales* shall be mentioned here.

The larger *Polypores* have attracted interest as long as the *Agarics*. Although as a rule their preservation does not offer any difficulties, there are very few old specimens in the herbaria. The correct application of the ancient names is thus often open to discussion. The resupinate species (with porose, spinose or smooth hymenia, of i.e. the families *Polyporaceae, Hydnaceae* and *Thelephoraceae* in the conventional sense) were in former times much neglected and considered to be rather few in number. KARSTEN in Finland was one of the first to study them microscopically and to describe new species based on microscopical details. Unfortunately, he did not reach a good understanding of these difficult plants and did not even recognize his own species when he found them again. The time of a better understanding of them began about half a century ago with BRESADOLA in Italy, VON HÖHNEL & LITSCHAUER in Austria, BOURDOT & GALZIN in France and BURT in the United States.

ROMELL in Sweden had already become strongly interested in them, made large collections (esp. round Stockholm, Femsjö and Abisko), studied them carefully and arrived at a good knowledge of a large number of them. He published almost nothing, except on *Polypores* (1911, 1912, 1926), but shared freely material and experiences with the students just mentioned. After his death his collections of *Thelephoraceae* were revised by LITSCHAUER, who published some of his results (1938, 1941a, 1941b, 1944).

For the last three decennia these fungi have been studied by LUNDELL who has made very large collections, esp. around Uppsala and Femsjö, but also in Blekinge and some other provinces. Numerous species, mostly with critical notes and information as to their distribution, have been distributed in LUNDELL & NANNFELDT, F. exs. suec. — JOHN ERIKSSON, a pupil of his, has taken up the study of this group. He has made large collections in various parts of Sweden, e.g. Skåne, Uppland, Hälsingland, Jämtland, Åsele Lappmark and Lule Lappmark (Muddus nationalpark) and also in Denmark (the Silkeborg area) and Norway. He has published a list of these fungi from Hallands Väderö (Skåne) (1948) and has in manuscript a very large list from Muddus. His studies of the previously almost unknown and relatively undisturbed conifer woods of Hälsingland, Jämtland, Swedish Lappland, and adjoining parts of Norway have revealed the presence in Scandinavia of several conspicuous species which evidently possess a wide more or less circumpolar distribution in the boreal conifer zone and in part also occur in the Carpathians. They seem in part to

belong to the "Taiga Element" as defined by the Finnish phytogeographer KALELA (1944 p. 159). — An investigation (ERIKSSON 1950) on a critical group *(Peniophora* sect. *Coloratae),* where crossing experiments have been utilized in defining the species, shows clearly how imperfect our knowledge still is about even conspicuous and common species. He found *P. Lycii* to be very common at the West coast of Sweden and listed some 60 finds. Only ten years earlier the first Swedish specimens had been collected (by NATHORST-WINDAHL) in Göteborg. He made himself all the finds in Skåne and Halland. The first specimens of his new species, the conspicuous *P. junipericola,* were collected in 1944, and six years later he knew it in ten localities in 4 different provinces. Less remarkable is the fact that all Swedish finds (nine in number) of the "Taiga" species *P. septentrionalis* were made by himself. — Through the combined efforts of several botanists and amateurs, material of all these fungi is rapidly accumulating in the Swedish museums. Many small and inconspicuous species remain to be discovered and described.

In Finland LAURILA (1939) took up the study in the '30s in a most promising way but died in the Winter War with Russia. In Norway this group, esp. the *Polypores,* were studied by EGELAND (1911, 1914). And JØRSTAD (e.g. 1928, 1932, 1937a) has for decennia collected and studied these fungi, esp. those of forest pathological importance. In Denmark they are now studied sucessfully by BUCHWALD (e.g. 1928, 1930), HARMSEN (e.g. 1953a, 1953b, 1954), SKOVSTED (1950) and especially CHRISTIANSEN (1950, 1953 a, 1953 b).

A considerable number of these species cause damage to our woods. In the publications by our plant pathologists much of mycofloristic interest can of course be found. Remember e.g. the studies on *Polyporus annosus* (ROLL-HANSEN 1940; RENNERFELT 1946). — The species growing on fruit-trees, whether parasitical or not, have also attracted special attention, e.g. by ROMELL (1925) in Sweden and by JØRSTAD (1948 a) and RAMSFJELL (1954) in Norway.

The *Tremellales* have as a rule been studied in connection with the *Aphyllophorales.* The Swedish species were revised by NEUHOFF (1936) but further research (by CORTIN 1944, INGELSTRÖM 1945, LUNDELL, NANNFELDT 1947 a.o.) has revealed the presence of some more species and considerably extended the known areas for several species. The recent studies in Denmark by BJØRNEKÆR (1944) and CHRISTIANSEN (1950, 1954) are worth mentioning, esp. CHRISTIANSEN's finds of *Tremella mycophaga, Tr. simplex* and *Tr. obscura*

which may be chosen to exemplify a truth that cannot be told too often — numerous species of fungi are restricted to most specific habitats, but as soon as the habitat is recognized, the species in question will prove to be anything but rare. Many species now considered as extremely rare, known perhaps only from the type collection, are certainly such that have a very narrow ecological amplitude and whose exact habitat has remained unknown.

3. THE PARASITICAL MICROFUNGI

We turn now to our third heading, the parasitic microfungi, the Rusts *(Uredinales)*, Smuts *(Ustilaginales)*, Mildews *(Erysiphales)* and Downy Mildews *(Peronosporales)*, as well as some other taxonomically more or less incoherent groups. These are mostly studied by other people than the previous groups. The distribution of each individual taxon is necessarily limited by the area of its host (the combined area of its hosts) or — in case of obligate host alternation — by the area common to the hosts of its different phases. The phytogeographical interest centers thus on one hand upon the establishing of what taxa occur with us and their host ranges, on the other hand upon the question as to whether the individual taxa follow their hosts all over their areas (are "homotopic") or have a more restricted distribution, topographically or ecologically (are "heterotopic"). In spite of the immense phytopathological importance of a number of these parasites, their scientific study began rather late with us.

The Rusts *(Uredinales)* are on the whole better known than the other groups under this heading.

Much pioneer work has been done in Denmark, especially on the heteroecism. With his experiments on the Black Rust *(Puccinia graminis)* in 1813-18, N. P. SCHØLER was several decennia before his time, and was consequently not duly appreciated. Other pioneer work, which has been of much value to the study of the Rusts and their host alternation, was performed in the '60s by A. S. ØRSTED and in the '70s and early '80s by P. NIELSEN. From the late '50s and until his death in 1907 E. ROSTRUP collected and studied all kinds of Danish microfungi and visited most parts of the country. Through numerous collegues, friends and pupils he got much material of microfungi. The enumeration of "Danish Fungi as represented in the

herbarium of E. ROSTRUP" published in 1913 by J. LIND lists not less than 3330 species of all groups except *Agarics* and *Myxomycetes*. About 300 belong to *Tremellales, Aphyllophorales, Gastromycetes* and the genus *Boletus*. The microfungi number thus about 3000. The work on Danish microfungi in general was continued by his son O. ROSTRUP and by J. LIND. As to the Rust-flora of Denmark rather little has been added after E. ROSTRUP's death. It can be considered as pretty well known.

In S w e d e n the first uredinologists were JAKOB ERIKSSON, C. J. JOHANSON, O. JUEL, G. LAGERHEIM and E. LJUNGSTRÖM. The investigations by ERIKSSON and his collaborator E. HENNING on Cereal Rusts led to the discovery of numerous physiological races, each specialized to one host or some few closely related hosts. These studies led within some groups to a multiplication of the number of species. They were soon followed up by numerous uredinologists and phytopathologists in all parts of the world. But as I have already mentioned, the modern trend is towards a reducing again of the number of taxa and their characterizing by merely or mainly morphological methods. The keen-eyed LAGERHEIM collected and studied the Rusts intensely for more than four decennia until his death in 1926. Very few of his results were published but his large collections from various parts of Scandinavia and also from other countries (now the property of Naturhistoriska Riksmuseet, Stockholm) contain a wealth of information, not least from a phytogeographical point of view. To the large collections of Rusts (and other parasitical fungi) in the Swedish museums TH. ARWIDSSON, H. CHRISTOFFERSSON, A. G. ELIASSON, K. FALCK, H. HAMBERG, H. HESSELMAN, TH. LINDFORS, J. A. NANNFELDT, BJ. PALM, G. V. SCHOTTE, T. VESTERGREN, J. VLEUGEL, and many others have contributed.

Lists on Rusts (as a rule comprising also other microfungi) in various parts of the country have been published by e.g. ARWIDSSON (1936 a & b, 1940), ELIASSON (1895, 1896, 1897, 1915, 1928, 1929 a & b, 1933), FALCK (1912, 1920), JOHANSON (1886), JUEL (1893, 1894, 1895, 1896, 1899, 1908, 1922), LAGERHEIM (1884 a & b, 1894, 1909), LIND (1907, 1928), LINDFORS (1910, 1913), LJUNGSTRÖM (1892), PALM (1908, 1910, 1917, 1923), ROSTRUP (1883), RYTZ (1927), TOLF (1891, 1897), VESTERGREN (1896), and VLEUGEL (1908 a & b, 1911, 1917). A voluminous list of micromycetes from Skåne has been published by HAMMARLUND (1933). The value of this list is strongly diminished by the facts that only little of the material seems to be preserved

and that the available part shows several obvious misdeterminations. ARWIDSSON (1942, 1951) has compiled a synopsis of *Pucciniastreae,* followed by one of the whole family *Melampsoraceae* in Sweden. — Numerous Swedish Rusts (and other microfungi) are distributed in the exsiccata edited by JAK. ERIKSSON (1882-95), LAGERBERG & SYLVÉN (1912-14), LUNDELL & NANNFELDT (1934-), ROMELL (1890-95) and VESTERGREN (1899-1914).

The Rusts of F i n l a n d were studied intensely by LIRO (earlier LINDROTH), who published a monograph in 1908. Many additional contributions to their phytogeography have been made by himself, his collaborators and pupils as well as other countrymen, e.g. HEIKINHEIMO (1932), KARI (1936), KUJALA (1950), RAINIO (1926), RAUHALA (1951, 1952, 1953 a & b), but also by e.g. LEPIK (1933, 1937). The exsiccatum edited by LIRO (1934-) and continued after his death by H. ROIVAINEN is devoted mainly to Rusts and Smuts. KARI is preparing another Finnish exsiccatum of microfungi.

In N o r w a y AXEL BLYTT was the first to show a more lively interest in the Rusts as well as in other parasitical fungi, and in 1896 he published a summary of what was known. Later JØRSTAD devoted most of his time to the study of this group, both taxonomically and phytogeographically. Through his numerous publications on Rusts (e.g. 1924, 1932, 1936, 1937, 1938, 1940) the Norwegian Rust flora has become very well-known. He has monographed the graminicolous Rusts (1951) and those on *Cyperaceae, Iridaceae* and *Juncaceae* (1954) and given a detailed account of the Norwegian distributions of the microcyclic Rusts on *Geranium* and *Solidago* (1948 b), of the Rusts on blackberries (1953 a) and of the members of *Pucciniastreae* and *Melampsoreae* (1953 b). — The contributions by HAGEN (1941, 1942) should also be mentioned.

In his paper on the "Geographical Distribution of Arctic Circumpolar Micromycetes" LIND (1934) publishes the results of his visit to Swedish Lappland and to Narvik in 1930 as well as those of his scrutinizing of the phanerogamic collections from north Scandinavia and the Arctic countries in the Copenhagen herbarium for microfungi. Amongst the species treated are also some few Rusts. His records unfortunately, can be used only with the utmost caution as misdeterminations (both as to fungus and host) are too frequent. For most species he tries to give their type of distribution.

In 1953, JØRSTAD in collaboration with HYLANDER and the author (HYLANDER, JØRSTAD & NANNFELDT 1953) published a check-list of

the Rusts of Scandinavia, indicating for each host the occurrence in the individual contries.

The main features of the topographical phytogeography of the Scandinavian Rust flora seem to stand out clearly. Most species are homotopic. Several are certainly southern, but such distributions are difficult to prove, as the south provinces are on the whole much better known than the northern. Some species are clearly northern; excellent examples are *Puccinia gigantea* on *Chamaenerion angustifolium* and *P. Svendsenii* on *Anthriscus silvestris*. LAGERHEIM (1909 p. 20) drew attention to a distributional type that he called "montane-maritime" and that he exemplified by *Uromyces Sommerfeltii* (= *U. Solidaginis* NIESSL), *Puccinia Virgae-aureae, P. Campanulae,* and *P. Sonchi*. In 1920, his pupil FALCK published maps of the Swedish distributions of the three Rusts on *Geranium,* each showing a type of its own. The Norwegian distributions of the *Solidago* Rusts and two of the *Geranium* Rusts have been worked out in detail by JØRSTAD (1948 b), who finds LAGERHEIM's expression "montane-maritime" hardly adequate. — It is also evident that many Rusts have a much narrower ecological amplitude than their hosts, but the observations hitherto made are too fragmentary to allow for any conclusions.

For the Smuts *(Ustilaginales)* we find on the whole the same collectors, and consequently about the same areas have been investigated. However, the number of serious students is far less, and it seems on the whole to be much more difficult to make a complete inventory of the Smut flora, for many conspicuous species are decidedly very rare and many common species (e.g. those of the genus *Entyloma)* are extremely inconspicuous or develop only very late in the year. There are thus certainly many more gaps in our knowledge, and very little can be said with certainty about the distributions in detail.

D e n m a r k. In the late '80s the ingenious Danish agronomist J. L. JENSEN, in collaboration with E. ROSTRUP, performed his fundamental studies on the specialization and life cycles of the Cereal Smuts. In 1890, E. ROSTRUP published a manual of the Danish Smuts. Several additional Smuts and hosts have later been found, and FERDINANDSEN & WINGE (1914) have monographed the most interesting genus *Entorrhiza.*

In F i n l a n d, J. I. LIRO devoted decennia to the study of Smuts and performed extensive culture experiments to show their host

specialization. His monograph (1924, 1938), which takes into account most European species and also a number of North American, is the most elaborate and multifarious treatise on Smuts in existence. His belief in a very narrow and unfailing host range led to an extreme splitting of the species. This, combined with a more or less unconscious supposition that the host ranges almost without exception exclude each other, led unfortunately to some neglect of morphological characters. His pupil V. B. LEHTOLA (1940) studied the taxa of *Cintractia* on some species of *Carex,* using for their definition esp. biometrical methods and their mode of germination. It can be said without exaggeration that the Smut flora of Finland is better known than that of any other country, both taxonomically and phytogeographically.

In Norway the Smuts were studied by A. BLYTT (1896) and later especially by JØRSTAD, who has given a list of the species known from Tröndelag (1936) and revised the genus *Urocystis* (1943).

In Sweden material has been collected by almost all collectors of parasitic fungi. But very little that is comprehensive has been published. In the '30s TH. ARWIDSSON (1936 b, 1940) began preparing a synopsis of the Swedish Smuts and i.a. scrutinized the phanerogamic collections of the Stockholm herbarium for such. This work was cut off by his death in 1949. Some years ago, BRITA LINDEBERG took up the same work and had a preliminary manuscript ready, when in 1955 death brought an abrupt end to her promising investigations. I hope it will be posible to have her results published in the near future.

The Mildews *(Erysiphales)* have aroused less interest amongst our collectors, especially when they appear only in the conidial state. They were long considered as a few rather polymorphous and polyphagous species, and little attention was paid to their host-ranges. It gradually turned out that they (just as most other true parasites) showed a strong host specialisation (the Swedish contributions to this subject should be mentioned, viz. HAMMARLUND 1924, 1945) and that there were also morphological (especially biometrical) differences between the different races. — In 1926, JØRSTAD published a monograph of the Norwegian Mildews. He encountered 25 species (according to SALMON's very wide species concept) and about 190 host species. Careful observations on the distribution and frequency on each separate host were given. In 1933, S. BLUMER published his monograph on the Mildews of Central Europe, in which the old

collective species were to some extent split up on morphological base. For each host the occurrence within the European countries is given as far as known to him, except for some of the most common races. — In Finland, KARI (1954) has devoted much work to the Mildews and their distribution.

The interest in the Downy Mildews *(Peronosporales)* has passed about the same stages as that in the true Mildews. The species of *Peronospora* known from the individual Scandinavian countries are listed in GÄUMANN's monograph (1923), which was in part based on material in the herbaria of Copenhagen, Stockholm and Uppsala. Some additions have been published, e.g. by ARWIDSSON (1940). The collective *Plasmopara umbelliferarum* was studied by L. HOLM (1946) with regard to biometry and distribution of its Swedish races upon its different hosts. A thorough study of the *Peronosporales* of Skåne has been undertaken by ARNE GUSTAVSSON (some preliminary results published 1953, 1954) and this investigation is now being extended to the whole of Scandinavia.

Of parasites of other groups on vascular plants I shall only mention a few which have been subjected to special studies in Scandinavia.

The imperfect genus *Ramularia* was monographed by LINDROTH (1902) in Finland, and ten years later VESTERGREN (1912) published a list of the Swedish representatives (incl. the only doubtfully distinct genera *Didymaria* and *Ovularia)*. The number of species is evidently not exhausted as yet, and the most interesting problems of their life-cycles remain to be studied. Some of them are known to belong to species of *Mycosphaerella* and perhaps they all belong to that genus. — Another large and interesting imperfect genus of parasites is *Septoria*. Some of its species belong also to *Mycosphaerella,* others which should probably be excluded from *Septoria* have other ascigerous states (e.g. *Leptosphaeria),* but of most species the life-cycles are unknown. The Danish graminicolous species have been treated monographically by FRANDSEN (1943). This genus offers many problems to be solved. And many such large genera as e.g. *Gloeosporium* s. lat. have been passed by without any serious interest being shown to them by Scandinavian mycologists. — Other phytopathologically important groups of *Fungi imperfecti* that have been monographed as to their Danish representatives but studied little or not at all in the other

Scandinavian countries are the genera *Alternaria* and *Stemphylium* (NEERGAARD 1945) and the graminicolous species of *Helminthosporium* (RAVN 1900, ANDERSEN 1954).

A homobasidiomycetous genus should also be mentioned in this connection, viz. the sclerotia-forming genus *Typhula (Clavariaceae)*. VANG (1945) has monographed the Danish species occurring upon agricultural plants. In Sweden EKSTRAND has for decennia been studying this genus but very few of his results are published as yet.

The genera *Exobasidium* and *Taphrina* have attracted the interest of several mycologists. The first, which parasitizes *Ericaceae,* takes a rather isolated position amongst the *Basidiomycetes.* It has been studied by e.g. E. ROSTRUP, LIND and, especially, JUEL (1912), who monographed the Scandinavian species and gave the main features of their distribution. *E. Vaccinii-uliginosi* on the three ubiquitous species *Vaccinium Myrtillus, V. uliginosum* and *V. Vitis-idaea* has a decidedly northern distribution being restricted to the Scandes and northernmost Scandinavia. — The genus *Taphrina* amongst the *Ascomycetes* takes also an isolated position taxonomically. Fundamental studies were undertaken in Sweden by JOHANSON (1885, 1887). The Danish species were monographed already in 1891 by E. ROSTRUP; in Sweden the studies were continued by JUEL (1909 and 1912), and in 1917 a monograph by PALM (1917 a) appeared, giving 36 Swedish species and their distribution. In spite of all these publications a good deal of work remains to be done both taxonomically and phytogeographically. — This enumeration could be continued but I shall not fatigue my listeners any more.

T h e l i c h e n p a r a s i t e s form a most interesting group, for obvious reasons, studied mostly by lichenologists. In the past, they were encountered more or less accidentally, and in Scandinavia no special studies have been devoted to them. For a period of years R. SANTESSON (1949) of Uppsala has collected material both from literature, herbaria and field studies for a synopsis of the Swedish species.

Another interesting group is that of A l g a l p a r a s i t e s, and this will be treated together with the aquatic Fungi.

T h e a n i m a l p a r a s i t e s. Fungi parasitize not only plants but also animals, even if the plant parasites outnumber by far the animal parasites. The latter form a most interesting group, containing

species of widely different affinity. Most numerous are those on insects and spiders. Some have relatively large fruit bodies, e.g. species of *Cordyceps,* and have consequently been known since older times. Others are small but nevertheless easy to observe thanks to their frequency and the immense number of conidia produced by them, e.g. *Empusa Muscae* on the common house fly. Most, however, escape notice, unless specially searched for. A most curious group is the *Laboulbeniales* with their characteristic diminutive fruit bodies "rooted" in the chitinous body wall of insects, esp. beetles. The monumental work of R. THAXTER in U.S.A. revealed the fact that the number of species is very high. They seem to be absent in the coldest parts of the world and THAXTER published a single find from Sweden. On special search a few species have now been found in the southern parts of Scandinavia (O. ROSTRUP 1916, 1935; ARWIDSSON 1946 b). Continued research and cooperation with entomologists will probably add much to our knowledge. Few special studies have been devoted to the other groups of entomogenous fungi in our countries, and the species recorded have mostly been found more or less accidentally. An exception is E. ROSTRUP's paper (1893) on the parasites on Danish arthropods.

4. THE SAPROPHYTICAL MICROFUNGI

We turn now to our fourth heading, the saprophytical microfungi. They are on the whole less studied than the previous groups. The number of students and collectors has been rather small. The publications and the material in our museums reflect thus to a high degree the interests and the collecting grounds of the individual workers.

I shall begin with the *Inoperculate Discomycetes,* which I know best, and also treat here those that are parasitical and should thus have been mentioned under the previous heading but amongst the *Inoperculates* the connection is very close between parasitical and saprophytical forms. The number of serious students has been very small, not only in Scandinavia.

KARSTEN in Finland began studying *Discomycetes* already in the late '50s and published a dissertation on the Finnish species in 1861. This paper was a very poor work, with the descriptions mostly taken from FRIES's "Systema", sometimes very primitive and vague notes on the spores were added. This paper induced

W. NYLANDER, the renowned lichenologist, to a critical study of the Finnish *Discomycetes* and in 1869, he published his most remarkable "Observationes circa Pezizas Fenniae" with detailed descriptions of asci, spores and paraphyses of all species. KARSTEN benefited from NYLANDER's harsh criticism and published the same year (1869) his "Monographia Pezizarum fennicarum", in which he accepted and even improved NYLANDER's mode of describing the species (also KARSTEN 1870). Two years later the first part of his "Mycologia fennica" followed, treating the *Discomycetes,* which volume is still an indispensable standard work. KARSTEN (e.g. 1885) kept for the rest of his life a lively interest in *Discomycetes* and added numerous species to the flora of Finland. His herbarium in Helsingfors is in fairly good condition and contains almost all specimens referred to in his numerous writings. His "Fungi Fenniae exsiccati" (KARSTEN 1861-70) is also very important, especially with regard to the *Discomycetes.* The Discomycetous flora of Mustiala and surroundings (Tavastia australis) must be considered rather well-known.

S w e d e n. In the beginning of his mycological career ROMELL in Sweden collected numerous *Discomycetes,* but the first Swede to devote himself to this group was K. STARBÄCK and in collecting he was greatly assisted by his most keen-eyed brother-in-law ERIK HAGLUND. STARBÄCK (e.g. 1887, 1889, 1890, 1895, 1898) made material contributions to the Swedish Discomycete flora and published a few papers on their taxonomy, which have proved to be of fundamental importance for future students. Unfortunately, his vivid interest in public affairs, which led i.a. to membership in the Swedish parliament, brought an end to his mycological studies. Interesting finds have also been made by a number of other mycologists; LAGERHEIM, VESTERGREN (e.g. 1896, 1897 b) and VLEUGEL (1908 b, 1911, 1917) should be specially mentioned. My own collecting has mainly concentrated upon the areas round Femsjö (Småland), Gryt (Östergötland), Uppsala (Uppland), Gävle (Gästrikland), Hamrafjället (Härjedalen), Handöl (Jämtland) and Abisko (Torne Lappmark). Numerous collegues have also brought important material from various parts of the country for determination (NANNFELDT e.g. 1928, 1931, 1936 a, 1942 b).

In N o r w a y no special study of the *Inoperculates* has been undertaken. The material collected before 1904 was revised by E. ROSTRUP, who in his treatment of the Norwegian *Ascomycetes* listed some 150 species of true *Discomycetes* (Operculates and Inopercu-

lates). JØRSTAD (e.g. 1945) contributes materially to the knowledge of the Inoperculates (as well as other Ascomycetes and Fungi imperfecti) of pathological importance to the economic plants of N o r w a y.

In D e n m a r k the two ROSTRUPS, father and son, J. LIND and several others have collected material of them. LIND's Danish Fungi (1913) lists some 330 species.

I estimate the total number of *Discomycetes* (Operculates and Inoperculates) at this moment known from Scandinavia to be about 850. For comparison it may be mentioned that the recent British check list (RAMSBOTTOM & BALFOUR-BROWNE 1951) enumerates a good thousand of them.

A heavy handicap to all floristic investigations on *Discomycetes* and *Ascomycetes* on the whole is their chaotic taxonomy, both as to the main lines and as to the delimitation of the species. All parts of the system are in strong need of critical monographs. The Danish species of *Sclerotinia* (s. lat.) are getting an elaborate treatment by BUCHWALD (1947, 1949). It should also be remembered that several *Inoperculates* of forest pathological importance, have been treated by e.g. BJÖRKMAN (1948), KUJALA (1950), LAGERBERG (1910, 1912, 1913, 1928, 1949) and ROBAK (1952).

A favourite group of the young ELIAS FRIES was the *Pyrenomycetes* in the widest sense of the word (and including also the *Sphaeropsidales,* which were indistinguishable as a group at that period). Already in 1816-19 he published his "Uppställning af de i Sverige funne Vårtsvampar (Scleromyci)", and in 1819 (E. FRIES 1819-34) he began distributing his Exsiccatum "Scleromyceti Sueciae" containing about 300 species. To a modern mycologist it is almost incredible how many species the "fathers of mycology" were able to distinguish and to recognize with the aid of the primitive optical equipment of their time. Nowadays a fungus of this kind is immediately put under the microscope to see the spores.

F i n l a n d. The first Scandinavian representative of the microscopical era was KARSTEN, whose treatment of the *Pyrenomycetes* for the "Mycologia Fennica" appeared in 1873. It was a very good work for its time and is still very useful. He later added many more *Pyrenomycetes* to the flora of Finland.

In D e n m a r k E. ROSTRUP's interest in them awoke early. His son O. ROSTRUP and J. LIND shared this interest. LIND (1913) could in his "Danish Fungi" list ca. 700 species. — For decennia P. LARSEN

studied Danish *Pyrenomycetes* carefully, describing and drawing them but preserving very little of his material. Some of his findings were posthumously edited (LARSEN 1952) by A. MUNK. The latter scientist (MUNK 1948, 1952, 1954) has for the last decennium studied the *Pyrenomycetes* intensely with the aim of improving their natural classification and of writing a flora of the Danish Pyrenomycetes.

In N o r w a y the *Pyrenomycetes* have been rather neglected. In ROSTRUP's "Norske Ascomyceter" (1904) based essentially upon A. BLYTT's and his own collections but also on stray contributions by other botanists, about 400 species are listed. Numerous species of interest from a phytopathological point of view have been recorded by JØRSTAD (e.g. 1945).

In S w e d e n, the young L. ROMELL collected and studied them intensively. He published very little about them but his large collections are most interesting and important. Worth mentioning are also contributions by ELIASSON, STARBÄCK (1887, 1888, 1889, 1890, 1896, 1898) and VESTERGREN; most important, however, are those by J. VLEUGEL, a surveyor of customs and amateur botanist. VLEUGEL studied the microflora (especially the *Pyrenomycetes)* of the areas around Umeå (Västerbotten) and Luleå (Norrbotten) very carefully. He showed much interest in the life cycles of the *Pyrenomycetes*. He was in close contact with H. KLEBAHN, and several of the species in KLEBAHN's classical work "Die Haupt- und Nebenfruchtformen der Askomyzeten" (1918) were studied on material contributed by him. His scientific life work demonstrates what important results can be achieved by a clever amateur, even though living far away from fellow botanists and with limited access to literature. It illustrates also how a person restricting his studies to a small area is given opportunities to discover species and establish life cycles, which would certainly have been missed in topographically more extensive studies. In mycology, as in most other branches of cryptogamology, we greatly need such intensive studies in order to find the more inconspicuous species. Special to mycology is the necessity of continuing these studies not only during all seasons of the year but also for a number of years, because the fungi are often very ephemeral and — at least the rarer of them — appear only in certain favourable years. — For the present the Swedish *Pyrenomycetes* (especially *Pseudosphaeriales)* are studied on a broad base by HOLM, who has published revisions of the genera *Ophiobolus, Leptosphaeria* and *Didymella* (1948, 1952, 1953).

I judge the number of *Pyrenomycetes* known at present from Scandinavia to be ca. 1000. The figure for Britain given by BISBY & MASON (1940) is 1383 (excl. of *Laboulbeniales)*.

On account of their noxiousness in the wood industry, species of the plectascalean genus *Ceratocystis (= Ophiostoma)* have been subjected to intensive studies. Some species causing blueing in conifer wood and in ground wood pulp have been studied by LAGERBERG (LAGERBERG, LUNDBERG & MELIN 1927) and the author (MELIN & NANNFELDT 1934) in Sweden and by ROBAK (1932) in Norway. For several years MATHIESEN-KÄÄRIK (1950, 1951, 1953) has been investigating this genus, taxonomically and ecologically, esp. as to its connections with certain bark beetles.

The saprophytical *Fungi imperfecti* have been rather little studied in Scandinavia, except by the ROSTRUPS in Denmark. — KARSTEN revised the Finnish *Sphaeropsidales* (1890) and *Hyphomycetes* (1892), but the number of species known to him was not too overwhelming (about 300 species parasitical and saprophytical of each group. — In Sweden, T. VESTERGREN began studying the *Sphaeropsidales* but very little was published (1897 a, 1900, 1906, 1907), and the *Hyphomycetes* are even more neglected. One of the first attempts to monograph the genus *Penicillium* was made by a Swede (WESTLING 1911). Amongst the new species in this monograph was *P. notatum,* now widely renowned as the producer of penicillin. JOHN ERIKSSON and the author have published a paper on *Costantinella* (1952) and have studies in progress on *Oidium* sensu LINDER and its basidiogerous perfect states *(Pellicularia)*.

I judge the number of *Coelomycetes* (i.e. *Sphaeropsidales* and *Melanconiales)* known from Scandinavia to be about 1000 and that of *Hyphomycetes* to be about 750. For sake of comparison it may be mentioned that GROVE's "British Stem- and Leaf-Fungi" (1935-37) treats 2100 species of *Coelomycetes* and that the recent British list of *Hyphomycetes* (WAKEFIELD & BISBY 1941) gives 1208 species.

The Slimy Moulds *(Myxomycetes)* are at least by tradition regarded as Fungi and the early mycologists considered them as closely related to the puff-balls. They form a small, extremely cosmopolitan group. The total number of species amounts to ca. 400 and about 1/3 of them are known from Scandinavia, a percentage which hardly has its equivalent in any other group of plants or animals.

The Danish species have been treated by RAUNKIAER (1886, 1888) and ELLIOTT (1926), the Finnish by HINTIKKA (1919), the Norwegian by A. BLYTT (1892) and the Swedish by ROB. E. FRIES (1899, 1912), another grand-son of ELIAS FRIES. For the present the Norwegian species are studied by ASTRID KARLSEN (1934, 1943) and the Swedish by SANTESSON (1948) and HARLING (1952).

As will be understood from the preceding, it is as a rule impossible to state anything about the Scandinavian distributions af the species of saprophytic micromycetes. One thing, however, is perfectly clear, and that is the presence in the Scandes of numerous species that are characteristic of Arctic and Alpine habitats and that never or only very rarely descend into the lowlands. Certainly there are also southern species, but such cannot as yet be pointed out with confidence. More than one species that I have been convinced to belong to that group, has sooner or later turned up amongst material brought home from the mountains.

5. THE HYPOGAEOUS FUNGI

The hypogaeous fungi form our fifth heading. Even the largest and commonest amongst them are rarely found except when specially searched for. Nevertheless, some have been known since time immemorial, e.g. the edible truffles and such genera as *Elaphomyces* and *Scleroderma,* which have played an important rôle in folk-lore and superstition. These truffle-shaped things are by no means taxonomically coherent. There are *Phycomycetes (Endogone), Ascomycetes* (the true truffles, *Elaphomyces* etc.) and *Basidiomycetes (Gastromycetes),* amongst them, but they have as a rule been studied by the same people. TH. M. FRIES, a son of ELIAS, summarized in 1909 what was then known from Scandinavia listing 31 species. Those belonging to the *Gastromycetes* were treated by his son, TH. C. E. FRIES, in his monograph on the Swedish *Gastromycetes* (1922). BUCHWALD (1929) has revised the Danish species of *Scleroderma.* Some species have later been added to the Swedish flora, e.g. *Endogone pisiformis* (LIHNELL 1937) *Gyrocratera Ploettneriana* and *Geopora Schackii* (NANNFELDT 1936 b, 1946). The species are known to be, on the whole, southern and calciphilous. The Scandinavian flora is considered to be rather poor, but it proves now to be richer than was generally thought a decennium ago, for MORTEN LANGE (e.g. 1951, M. LANGE & LUND

1954) in Denmark and F.-E. ECKBLAD (1954) in Norway, who have begun searching for them systematically, have been most successful in making remarkable finds. During an excursion after the Botanical Congress in Stockholm 1950 M. LANGE and the British mycologist LILIAN HAWKER (LANGE & HAWKER 1951) extended the known ranges of several species, and added the interesting *Chamonixia caespitosa* to the Scandinavian flora.

But there are also other hypogeous fungi. Of course the mycelia of all terrestrial fungi, *Agarics* and others, are hypogean although their fruit bodies are epigaean. But there is a rich, truly hypogean microflora of the soil, especially of *Phycomycetes* and *Hyphomycetes* which do not form any large fruit bodies. This microflora has been very little studied in Scandinavia. O. ROSTRUP in Denmark paid some attention to it, and in Norway certain aspects have been studied, e.g. the *Mucorineae* by HAGEM, the genus *Penicillium* by SOPP (1912) and cellulose-decomposing species by TRAAEN (1914). In Sweden and Finland the microflora of the soil is practically unknown taxonomically. And such interesting fungi as the nematode-capturing fungi studied by DRECHSLER in U.S.A. are completely unknown. Why should they not occur also in Scandinavian soils?

6. THE AQUATIC (LACUSTRINE AND MARINE) FUNGI

My sixth and last heading, the aquatic fungi, is still more heterogeneous. Water is known to be the typical element for *Algae,* just as air is that for *Fungi.* There are nevertheless a number of *Fungi* growing in water, but very few that form larger fruit bodies. There seems to be no truly aquatic *Basidiomycetes,* except some few smuts *(Doassansia* and allies) parasitizing aquatic plants and whose spore-balls may float on water. The spore discharge mechanism of the basidium is rendered incapable of functioning by even the thinnest film of water, whereas the discharge mechanism may still function in an ascus completely immersed. Nevertheless, the truly aquatic *Ascomycetes* seem to be rather few in number. Some *Discomycetes* known of old (e.g. *Vibrissea* and *Apostemidium)* form their apothecia in streams just near the surface of water and appear now slightly above it, now slightly beneath. It is also known of old that several *Discomycetes, Pyrenomycetes* and *Sphaeropsidales* occur on dead culms of

reed and similar plants. Such species were considered to be fundamentally aerial until recently, when INGOLD and his collaborators showed that they formed part of a truly aquatic flora containing several undescribed, most remarkable species and genera. This flora has not been studied in Scandinavia. INGOLD has also demonstrated the existence of a rather rich hyphomycetous flora developing on leaves and other vegetable débris covered by a thin layer of water. Also this ecological group of Fungi opens a new world to the Scandinavian mycologists.

The *Ascomycetes* and *Hyphomycetes* referred to in the preceding are those of fresh-water. There is also a corresponding marine flora. A few species have rather long been known to occur on larger *Algae*. One such species parasitic on *Chondrus crispus, Leptosphaeria marina* ROSTR. *(= L. danica* BERLESE) was described from Denmark by ROSTRUP as early as 1889. Two more species have later become known from Scandinavia. — In 1944, the North American scientists E. S. BARGHOORN & D. H. LINDER drew attention to the existence of a rather rich fungus flora on timber and other plant remains in the sea, composed of both *Pyrenomycetes, Sphaeropsidales* and *Hyphomycetes,* nothing but undescribed species. One species has this year been described from Copenhagen (and Germany) by HÖHNK (1955). This ecological group of fungi is now being studied on the Swedish west-coast by R. SANTESSON.

The majority of the aquatic *Fungi,* both lacustrine and marine, are, however, phycomycetous. There are several ecological types amongst them. One is the Water Moulds *(Saprolegniales),* which grow on various organic débris, both vegetable and animal. They were studied in Finland many years ago by HÄYRÉN (1904) and in Denmark by PETERSEN (1909, 1910) and OBEL (1910, 1911). Some years later E. GÄUMANN (1918) devoted part of a summer's stay at Abisko to their study in Swedish Lappland. There is much to be desired, until the *Saprolegniales* of Sweden can be considered as well-known. — The *Monoblepharidales* studied by LAGERHEIM (1900) in Sweden belong to the same category.

Another ecological type is the parasites on small Algae, pollen grains floating on water etc. LAGERHEIM with his vivid interest in all kinds of small, curious organisms reported as early as 1884 (a, b) a few such species from Sweden, also later some representatives were treated by him (e.g. 1888, 1890, 1892). Denmark is the only Scandinavian country, where this group has been

studied carefully, both fresh-water and marine forms by PETERSEN (1903, 1905, 1909, 1910), fresh-water forms by A. LUND (1930, 1934) and marine forms by the American mycologist SPARROW (1934), From the other Scandinavian countries there are only stray contributions, from Norway by e.g. BLYTT (1896), GRAN (1900) and WILLE (1899). In his worldmonograph "Aquatic *Phycomycetes,* exclusive of the *Saprolegniaceae* and *Pythium*" SPARROW (1943) gives a full account of the countries from where the individual species have been recorded. Recently, the Egyptian algologist ALEEM (1953) during his stay at the Swedish west-coast paid much attention to these Fungi. But we are still far from a sufficient knowledge of them.

Limnomyces neglectus, an inconspicuous parasite on *Elatine triandra* (but on no other species) recently described by LOHAMMAR (1953), affords a striking example of a fungus, which has escaped notion because of its restricted and unusual habitat but, in fact, is very common, being present in more than half of the herbarium specimens from all over the area of the host.

I have now finished my rapid run through the various groups of Fungi, the various countries and provinces of Scandinavia and the various habitats. I hope I have been able to give you the same impression as I have acquired myself when thinking over my theme, viz. that there are almost unlimited possibilities for further research. There are only few groups of Fungi that can be considered as fairly well-known within Scandinavia. And even in groups where no important taxonomical progress nor any large numerical increase in the number of species can be expected, we are very far from knowing the topographical distributions of the individual species and still more distant from a good understanding of their ecology.

I hope also that it is clear that important investigations can still be undertaken with simple means and that much work remains to be done, even just round one's own home. Every careful student, professional or amateur, can make important contributions to the mycofloristical exploration of his country by specializing upon a certain group, a certain area or a certain habitat.

LITERATURE

Aleem, A. A., 1953: Marine fungi from the West-Coast of Sweden. — Ark. f. Bot. 2:3:1.

Andersen, H., 1954: Species of *Helminthosporium* on Cereals and Grasses in Denmark. — Friesia 5: 80-89.

Andersson, O., 1939: Bidrag till Skånes flora 5. Notiser om intressanta storsvampar. — Bot. Not. 1939: 819-825.

— 1940: Ditto 7. Ditto. — Ibid. 1940: 406-412.

— 1941: Ditto 10. Ditto. — Ibid. 1941: 393-406.

— 1942: Ditto 16. Ditto. — Ibid. 1942: 375-382.

— 1943: Studier över Boletaceer. — Ibid. 1943: 185-202.

— 1945: Utbredningen av *Schizophyllum commune* FR. och *Trogia crispa* (PERS.) FR. i Fennoskandia s. str. — Friesia 3: 129-142.

— 1950 a: Bidrag till Skånes flora 44. Tre nya gasteromyceter. — Bot. Not. 1950: 69-79.

— 1950 b: Larger Fungi on Sandy Grass Heaths and Sand Dunes in Scandinavia. — Bot. Not. Suppl. 2:2.

Arwidsson, Th., 1936 a: Über einige auf der Gattung *Empetrum* vorkommende Pilze. — Sv. Bot. Tidskr. 30: 401-418.

— 1936 b: Mykologische Beiträge 1-4. — Bot. Not. 1936: 463-480.

— 1936 c: Norrländska gasteromycetlokaler. — Id.: 532-538.

— 1938: Über homotope und heterotope Parasiten. — Zeitsch. f. Parasitenk. 10: 153-156.

— 1940: Mykologische Beiträge 5-9. — Bot. Not. 1940: 370-388.

— 1942: Die in Schweden beobachteten Arten von *Pucciniastrum* OTTH und verwandten Uredineengattungen. — Sv. Bot. Tidskr. 36: 100-107.

— 1945: *Secotium agaricoides* (CZERN.) HOLL. i Sverige. — Ibid. 39: 137-140.

— 1946 a: *Geaster floriformis* VITT. funnen i Sverige. — Ibid. 40: 214-216.

— 1946 b: Om svenska laboulbeniacéfynd. — Id.: 307-309.

— 1951: Die Uredineen Schwedens (I. *Melampsoraceae,* q.p.). — Uredineana 3 (= Encycl. Mycol. 16): 222-243.

Bille-Hansen, E., 1954: The Danish species of *Geoglossum* and related genera. — Bot. Tidsskr. 51: 7-18.

Bisby, G. R., & Mason, E. W., 1940: List of *Pyrenomycetes* recorded for Britain. — Trans. Brit. Myc. Soc. 24: 127-243.

Björkman, E., 1948: Studier över snöskyttesvampens *(Phacidium infestans* KARST.) biologi.... — Medd. Statens Skogsforskningsinst. 37:2.

Bjørnekær, K., 1944: Floristiske Undersøgelser over danske Bævresvampe *(Tremellaceae).* — Friesia 3: 1-34.

Blumer, S., 1933: Die Erysiphaceen Mitteleuropas.... — Beitr. Krypt.-Fl. Schweiz 7:1.

Blytt, A., 1892: Bidrag til kundskaben om Norges soparter III. Myxomyceter. — Christiania Vid.-Selsk. Forh. 1892:2.

Blytt, A., 1896: Ditto IV. *Peronosporaceae, Chytridiaceae, Protomycetaceae, Ustilagineae, Uredineae.* — Ibid. 1896:6.

— 1905: Norges Hymenomyceter. — Christiania Vid.-Selsk. Skr., I. Math.-nat. Kl. 1904:6.

Buchwald, N. F., 1928: De danske Arter af Slægten *Merulius* (HALL.) FR. med en særlig Omtale af Gruppen *Coniophori* FR. — Dansk Bot. Ark. 5:21.

— 1929: Oversigt over de hidtil kendte danske *Scleroderma*-Arter. — Medd. For. Svampek. Fr. 4: 29-33.

— 1930: Tønder- eller Fyrsvampen *(Polyporus fomentarius* (L.) FR.) — Ibid. 4: 49-92.

— 1947: *Sclerotiniaceae Daniae.* I. — Friesia 3: 235-330.

— 1949: Studies in the *Sclerotiniaceae.* I. Taxonomy of the *Sclerotiniaceae.* — K. Vet.- og Landbohøjsk. Aarsskr. 1949: 75-191.

Bülow, W., 1889: Bidrag till Skånes svampflora. I. Hattsvampar (q.p.). — Bot. Not. 1889: 131-142.

Christiansen, M. P., 1950: Bidrag til Kendskabet af Danmarks resupinate Svampe. I. — Friesia 4: 89-97.

— 1953 a: Ditto II. *Hydnaceae resupinatae, Radulum* FR. og *Grandinia* FR. — Id.: 296-306.

— 1953 b: Ditto III. *Hydnaceae resupinatae, Odontia* FR., *Mycoleptodon* PAT., *Mycoacia* DONK og *Kavinia* PILÁT. — Id.: 314-338.

— 1954: Tre ejendommelige *Tremella*-Arter: *Tremella mycophaga* MARTIN, *Tremella simplex* JACKS. & MARTIN og *Tremella obscura* (OLIVE) comb. n., paavist i Danmark. — Ibid. 5: 55-64.

Cortin, B., 1945: *Guepinia helvelloides* (DC.) FR. funnen i Jämtland. — Sv. Bot. Tidskr. 39: 120-121.

Eckblad, F.-E., 1951: The genus *Tulostoma* in Norway. — Blyttia 9: 116-119.

— 1952: Oversikt over Norges *Geastrum*-arter. — Ibid. 10: 1-9.

— 1954: Studies in the Hypogaean Fungi of Norway. I. *Endogone* and *Tuberales.* — Nytt Mag. f. Bot. 3: 35-40.

— & **Wischmann, F.,** 1953: To for Norge nye Phallaceer. — Blyttia 11: 133-139.

Egeland, J., 1911: Meddelelser om norske hymenomyceter. I. — Nyt Mag. f. Naturvid. 49: 341-380.

— 1912: Meddelelser om norske hymenomyceter. II. — Ibid. 51: 53-93.

— 1913: Meddelelser om norske hymenomyceter. III. — Ibid. 51: 363-383.

— 1914: Norske resupinate poresopper. — Ibid. 52: 123-171.

Eklund, O., 1943: Zur Pilzflora des Schärenarchipels SW.-Finnlands. — Mem. Soc. F. Fl. F. 18: 2-21.

— 1944: Weitere Beiträge zur Pilzflora des Schärenarchipels SW.-Finnlands. — Ibid. 19: 212-216.

Eliasson, A. G., 1895: Fungi suecici. — Bot. Not. 1895: 17-24, 57-64, 107-116.
— 1896: Svampar ur C. J. JOHANSONs herbarium. — Ibid. 1896: 205-214.
— 1897: Fungi upsalienses. — Bih. K. Sv. Vet.-Akad. Handl. 22:III:12.
— 1915: Svampar från Småland. — Sv. Bot. Tidskr. 9: 401-413.
— 1928: Svampar från Bohuslän. — Ibid. 22: 417-436.
— 1929 a: Svampar från Halland. — Ibid. 23: 233-240.
— 1929 b: Svampar från Blekinge och Småland. — Id.: 336-346.
— 1933: Svampar från Gotland och Öland. — Ibid. 27: 141-160.

Elliott, W. T., 1926: Danish *Myxomycetes* contained in the Botanical Museum of the University of Copenhagen. — Bot. Tidsskr. 39: 357-367.

Eriksson, Jak., 1882-95: Fungi parasitici scandinavici exsiccati. (500 numbers.)

Eriksson, John, 1948: Något om Hallands Väderös vedbeboende basidiomyceter. — K. Fysiogr. Sällsk. Lund Förh. 18:8.
— 1950: *Peniophora* CKE. sect. *Coloratae* BOURD & GALZ. A taxonomical study with special reference to the Swedish species. — Symb. Bot. Upsal. 10:5.

Falck, K., 1912: Bidrag till kännedomen om Härjedalens parasitsvampflora. — Ark. f. Bot. 12:5.
— 1920: Mykogeografiska anteckningar från Medelpad. — Sv. Bot. Tidskr. 14: 223-231.

Ferdinandsen, C., & Winge, Ø., 1914: Studies in the genus *Entorrhiza* C. WEBER. — Dansk Bot. Ark. 2:1.

Frandsen, N. O., 1943: *Septoria*-Arten des Getreides und anderer Gräser in Dänemark. — Medd. Plantepat. Afdel. Vet.- og Landbohøjsk., København. 26.

Frey, F., 1944: Några anteckningar om basidsvampfloran på Åland. — Mem. Soc. F. Fl. F. 19: 9-16.

Fries, E., 1816-19: Uppställning af de i Sverige funne Vårtsvampar (Scleromyci). — Sv. Vet.-Akad. Handl. 1816: 126-157; 1817: 81-149, 245-271; 1818: 100-120, 356-361; 1819: 87-112.
— 1819-34: Scleromyceti Sveciae. (300 numbers.)
— 1825-27: Stirpes agri femsionensis. — Londini Gothorum.
— 1845: Summa vegetabilium Scandinaviae... I. — Upsaliae.
— 1849: Ditto II. — Upsaliae.
— 1853: Botaniska utflygter 1, uppl. 2. — Stockholm.

Fries, O. Rob., 1888: Synopsis Hymenomycetum regionis gothoburgensis. — Göteb. Vet. o. Vitt. Samh. Handl. 23: 1-79.
— 1900: In synopsin Hymenomycetum regionis gothoburgensis additamentum. — Ibid. 4:3.
— 1907: Anteckningar om svenska hymenomyceter. — Ark. f. Bot. 6:15.

Fries, Rob. E., 1899: Sveriges Myxomyceter. — Öfvers. K. Vet.-Akad. Förh. 56: 215-246.

— 1912: Den svenska myxomycet-floran. — Sv. Bot. Tidskr. 6: 721-802.

Fries, Th. C. E., 1918: Bidrag till Tromsö amts gasteromycetflora. — Bergens Mus. Aarsh. 1917-18, Math.-nat. R. 11.

— 1921: Sveriges gasteromyceter. — Ark. f. Bot. 17:9.

Fries, Th. M., 1912: Skandinaviens tryfflar och tryffelliknande svampar. — Sv. Bot. Tidskr. 3: 223-300.

Fåhraeus, G., & Stenlid, G., 1954: Anteckningar om svampfloran i Älvkarleby. — Sv. Bot. Tidskr. 48: 771-795.

Gislén, T., 1940: The number of Animal Species in Sweden... — Lunds Univ. Årsskr. N. F. 2:36:2 (= K. Fysiogr. Sällsk. Handl. N. F. 51:2).

Gran, H. H., 1900: Bemerkungen über einige Plankton-Diatomeen. — Nyt Mag. f. Naturvid. 38: 105-128.

Grove, W. B., 1935-37: British stem- and leaf-fungi *(Coelomycetes)* 1-2. — Cambridge.

Gustavsson, A., 1953: Some species of the genera *Peronospora* and *Pseudoperonospora* new to Sweden. — Bot. Not. 1953: 48-64.

— 1954: The distribution of *Pseudoperonospora erodii* (FUCK.) WILS. in Skåne (Scania), South Sweden. — Ibid. 1954: 34-38.

Gäumann, E., 1918: Ein Beitrag zur Kenntnis der lappländischen Saprolegnieen. — Bot. Not. 1918: 151-159.

— 1923: Beiträge zu einer Monographie der Gattung *Peronospora* CORDA. — Beitr. Krypt.-Fl. Schweiz 5:4.

Hagem, O., 1907-10: Untersuchungen über norwegische Mucorineen 1-2. — (Christiania) Vidensk. Selsk. Skr., I Math.-nat. Kl. 1907:7 & 1910:4.

— 1910 b: Neue Untersuchungen über norwegische Mucorineen. — Ann. Myc. 8: 265-286.

Hagen, A., 1941: Notes on Norwegian *Uredineae.* — Nytt Mag. f. Naturvid. 82: 123-140.

— 1942: Contribution to the Rust and Smut Flora of Tröndelag 1-2. — K. Norsk. Vid.-Selsk. Forh. 15:3: 9-12 & 15:5: 17-20.

Hammarlund, C., 1924: Zur Genetik, Biologie und Physiologie einiger Erysiphaceen. — Hereditas 6: 1-126. (Also diss., Lund).

— 1933: Beiträge zur Kenntnis der Mikromycetenflora der Provinz Skåne (Schonen). — Ark. f. Bot. 25A:3.

— 1945: Beiträge zur Revision einiger imperfekten Mehltau-Arten. *Erysiphe polyphaga* nov. sp. — Bot. Not. 1945: 101-108.

Harling, G., 1952: Notes on Myxomycetes I. *Physarum Diderma* ROST., new to Sweden. — Sv. Bot. Tidskr. 46: 47-52.

Harmsen, L., 1953a: *Merulius tignicola* sp. nov. og dens Forekomst i Danmark. — Friesia 4: 243-256.

— 1953b: *Merulius molluscus* FR., en sklerotiedannende *Merulius*-Art. — Blyttia 11: 116-120.

— 1954: De danske *Merulius*-Arter. — Bot. Tidsskr. 50: 146-162.

Heikinheimo, V., 1932: Seltene Rostpilze aus Finnisch-Lappland. — Ann. Bot. Soc. Vanamo 2:6: 5-8.

Henning, E., 1885: Bidrag till svampfloran i Norges sydligare fjelltrakter. — Öfvers. K. Vet.-Akad. Förh. 42:5: 49-75.

— 1887: Växtfysiognomiska anteckningar från västra Härjedalen med särskild hänsyn till hymenomyceternas förekomst inom olika växtformationer. — Bih. K. Sv. Vet.-Akad. Handl. 13:III:1.

Hertz, S., 1947: *Geaster minimus* funnen i Lappland. — Sv. Bot. Tidskr. 41: 486-487.

Hintikka, T. J., 1919: Révision de Myxogastres de Finlande. — Acta Soc. F. Fl. F. 46.

Holm, L., 1946: On the variation of the conidia in *Plasmopara umbelliferarum* (CASP.) SCHROET. in relation to different hosts. — Sv. Bot. Tidskr. 40: 55-62.

— 1948: Taxonomical Notes on *Ascomycetes*. I. The Swedish species of the genus *Ophiobolus* RIESS sensu SACC. — Ibid. 42: 337-347.

— 1952: Ditto II. The herbicolous Swedish species of the genus *Leptosphaeria* CES. et DE NOT. — Ibid. 46: 18—46.

— 1953: Ditto III. The herbicolous Swedish species of the genus *Didymella* SACC. — Ibid. 47: 520-525.

Hylander, N., Jørstad, I. & Nannfeldt, J. A., 1953: Enumeratio *Uredinearum* scandinavicarum. — Op. Bot. (Lund) 1:1.

Häyrén, E., 1904: Verzeichnis einiger in der Nähe von Helsingfors eingesammelten Saprolegniaceen. — Medd. Soc. F. Fl. F. 29: 165-166.

Höhnk, W., 1955: Studien zur Brack- und Seewassermykologie V. — Veröff. Inst. Meeresforsch. Bremerhaven 4.

Imai, S., 1940: The *Geoglossaceae* of Norway. — Ann. Myc. 38: 268-278.

Ingelström, E., 1944: *Guepinia helvelloides* (DC.) FR. från Medelpad. — Sv. Bot. Tidskr. 38: 434-435.

Johanson, C. J., 1885: Om svampslägtet *Taphrina* och dithörande svenska arter. — Öfvers. K. Vet.-Akad. Förh. 42:1:29-47.

— 1886: Peronosporaceerna, Ustilagineerna och Uredineerna i Jemtlands och Herjedalens fjälltrakter. — Bot. Not. 1886: 164-176.

— 1887: Studier öfver svampsläktet *Taphrina*. — Bih. K. Sv. Vet.-Akad. Handl. 13:III:4.

Juel, H. O., 1893: Om några heteroeciska uredineer. — Bot. Not. 1893: 51-57.

— 1894: Mykologische Beiträge 1-3. — Öfvers. K. Vet.-Akad. Förh. 51: 409-418, 491-502, 503-508.

— 1895: Ditto 4. — Ibid. 52: 379-386.

— 1896: Ditto 5. — Ibid. 53: 213-224.

— 1899: Ditto 6. — Ibid. 56: 5-19.

— 1908: Ein Beitrag zur Kenntnis der *Uromyces Poae* RABENH. — Sv. Bot. Tidskr. 2: 167-174.

— 1909: Om *Taphrina*-arter på *Betula*. — Ibid. 3: 183-191.

Juel, H. O., 1912: Beiträge zur Kenntnis der Gattungen *Taphrina* und *Exobasidium*. — Ibid. 6: 353-372.

— 1922: Mykologische Beiträge 8. — Ark. f. Bot. 18:6.

Jørstad, I., 1924: Hardangers rustsopper. — Bergens Mus. Aarb. 1921-22, Naturv. R. 4.

— 1926: The Erysiphaceae of Norway. — Skr. Norske Vid.-Akad. Oslo, I Mat.-Nat. Kl. 1925:10.

— 1928: Nord-Norges skogsykdommer. — Tidsskr. f. Skogbruk 36: 365-456.

— 1932: Norske resupinate hydnaceer. — Friesia 1: 3-20.

— 1936: *Uredinales* and *Ustilaginales* of Trøndelag. — K. Norske Vid.-Selsk. Skr. 1935:38.

— 1937 a: Aphyllophoraceous *Hymenomycetes* from Trøndelag. — Ibid. 1936:10.

— 1937 b: Notes on some heteroecious rust fungi. — Nytt Mag. f. Naturvid. 77: 105-119.

— 1938: Adventive elementer og nytilgang på verter indenfor vår rustsoppflora. — Ibid. 78: 153-200.

— 1940: Uredinales of Northern Norway. — Skr. Norske Vid.-Akad. Oslo, I Mat.-Nat. Kl. 1940:6.

— 1943: The ustilagineous genus *Tuburcinia* in Norway. — Nytt Mag. f. Naturvid. 83: 231-246.

— 1945: Parasittsoppene på kultur- og nyttevekster i Norge 1. Sekksporesopper *(Ascomycetes)* og konidiesopper *(Fungi imperfecti)*. — Melding Statens Plantepatol. Inst. 1 (= Tillegg C Landbruksdir. melding f. 1943).

— 1948 a: Storsopper på frukttrær og bærbusker i Norge. — Friesia 3: 352-376.

— 1948 b: Mikrocyclic *Uredineae* on *Geranium* and *Solidago*. — Nytt Mag. f. Naturvid. 86: 1-30.

— 1951: The graminicolous rust fungi of Norway. — Skr. Norske Vid.-Akad. Oslo, I Mat.-Nat. Kl. 1950:3.

— 1953 a: Host specialization within Norwegian blackberry rusts. — Blyttia 11: 6-15.

— 1953 b: *Pucciniastreae* and *Melampsoreae* of Norway. — Uredineana 4 (= Encycl. Mycol. 24): 91-123.

Kalela, A., 1944: Systematische und pflanzengeographische Studien an der *Carex*-subsektion *Alpinae* KALELA. Ein Beitrag zur Kenntnis der pleistozänen und holozänen Pflanzenwanderungen im holarktischen Raum. — Ann. Bot. Soc. Vanamo 19:3.

Kari, L. E., 1936: Mikromyceten aus Finnisch-Lappland. — Ann. Bot. Soc. Vanamo 8:3.

— 1954: Beiträge zur Kenntnis der Erysiphaceen-Flora Finnlands. — Ann. Univ. Turku. A:17:3.

Karlsen, Astrid, 1934: Studies on *Myxomycetes* I. New records for Norway. — Bergens Mus. Årb. 1934, Naturv. R. 1.

Karlsen, Astrid, 1943: Ditto II. The Myxomycete Flora of Hardanger. — Ibid. 1943:4.

Karsten, P. A., 1861: Synopsis *Pezizarum* et *Ascobolorum* Fenniae. — Helsingfors. (Diss.).

— 1861-70: Fungi Fenniae exsiccati. (1000 numbers.)

— 1869: Monographia *Pezizarum* fennicarum. — Not. Sällsk. F. Fl. F. Förh. 10: 99-206.

— 1870: Monographia *Ascobolorum* Fenniae. — Ibid. 11: 197-210.

— 1871: Mycologia fennica I. *Discomycetes.* — Bidr. känned. Finl. nat. o. folk 19.

— 1873: Ditto II. *Pyrenomycetes.* — Ibid. 23.

— 1885: Revisio monographica atque synopsis *Ascomycetum* in Fennia hucusque detectorum. — Acta Soc. F. Fl. F. 2:6.

— 1890: Spaeropsideae hucusque in Fennia observatae. — Ibid. 6:2.

— 1892: Finlands mögelsvampar *(Hyphomycetes* fennici). — Bidr. känned. Finl. nat. o. folk 51: 343-534.

Klebahn, H., 1918: Haupt- und Nebenfruchtformen der Askomyzeten 1 (q.p.) — Leipzig.

Kujala, V., 1950: Über die Kleinpilze der Koniferen in Finnland: *Ascomycetes, Fungi imperfecti, Uredinales.* — Comm. Inst. Forest. Fenn. 38:4.

Laestadius, C. P., 1860: Bidrag till kännedomen om växtligheten i Torneå Lappmark — Uppsala. (Diss.)

Lagerberg, T., 1910: Om gråbarrsjukan hos tallen, dess orsaker och verkningar. — Skogsvårdsfören. Tidskr. 1910: 221-248, 357-382 (also Medd. Statens Skogsförsöksanst. 7: 127-174).

— 1912: Studier öfver den norrländska tallens sjukdomar, särskildt med hänsyn till dess föryngring. — Ibid. 1912: 291-326 (also ibid. 9: 135-170).

— 1913: En abnorm barrfällning hos tallen. — Ibid. 1913: 435-476 (also ibid. 10: 139-180).

— 1928: Über *Naevia piniperda* REHM. — Sv. Bot. Tidskr. 22: 282-288.

— 1949: Some Notes on the *Phacidiaceae* and a new member of this family, *Lophophacidium hyperboreum* nov. gen. et sp. — Ibid. 43: 420-437.

— & **Lundberg, G. & Melin, E.,** 1927: Biological and practical researches into blueing in pine and spruce. — Sv. Skogsvårdsfören. Tidskr. 25: 145-272, 561-739.

— & **Sylvén, N.,** 1912-14: Skogens skadesvampar. (50 numbers.)

Lagerheim, G., 1884 a: Algologiska och mykologiska anteckningar från en botanisk resa i Luleå Lappmark. — Öfvers. K. Sv. Vet.-Akad. Förh. 41: 91-119.

— 1884 b: Mykologiska bidrag. 1-2. — Bot. Not. 1884: 148-155.

— 1888: Sur un genre nouveau de Chytridiacées. Parasite des urédospores de certaines Urédinées. — Journ. de Bot. 2: 432-440.

Lagerheim, G., 1890: *Harpochytrium* und *Achlyella,* zwei neue Chytridiaceen-Gattungen. — Hedw. 29: 142-145.

— 1892: *Mastigochytrium,* eine neue Gattung der Chytridiaceen. — Ibid. 31: 185-189.

— 1894: *Uredineae* Herbarii ELIAE FRIES. — Tromsø Mus. Aarsh. 17.

— 1900: Mykologische Studien. 2. Untersuchungen über die Monoblepharideen. — Bih. K. Sv. Vet.-Akad. Handl. 25:III:8.

— 1909: Verzeichnis von parasitischen Pilzen aus Södermanland und Bohuslän. — Sv. Bot. Tidskr. 3: 18-40.

Lange, J. E., 1935-1940: Flora agaricina danica 1-5. — Copenhagen.

Lange, M., 1946: Mykologiske Indtryk fra Lapland. — Friesia 3: 161-170.

— 1948: The Agarics of Maglemose. A study in the ecology of the Agarics. — Dansk Bot. Ark. 13:1.

— 1950: Bidrag til Danmarks Gasteromycet-Flora. — Friesia 4: 66-71.

— 1951: *Genea hispidula* BERK. (En for Danmark ny hypogæisk storsvamp). — Bot. Tidsskr. 48: 214-216.

— **& Hawker, Lilian E.,** 1951: Some hypogeal *Gasteromycetes* from Jämtland, Sweden, and adjacent districts of Norway. — Sv. Bot. Tidskr. 45: 591-596.

— **& Lund, Else Margarethe,** 1954: The genus *Endogone* in Denmark. — Friesia 5: 90-95.

Larsen, P., 1952: Studies in Danish *Pyrenomycetes.* A manuscript compiled and annotated by ANDERS MUNK. — Dansk Bot. Ark. 14:7.

Laurila, M., 1939: *Basidiomycetes* novi rarioresque in Fennia collecti. — Ann. Bot. Soc. Vanamo 10:4.

Lehtola, V. B., 1940: Untersuchungen über einige Brandpilze der Gattung *Cintractia* CORNU. — Acta Agral. Fenn. 42. (Also diss., Helsingfors.)

Lepik, E., 1933: Verzeichnis der in Sommer 1932 in Lappland gesammelten Pilze. — Sitzungsber. Naturf. Ges. Univ. Tartu 40: 225-232.

— 1937: Über das Vorkommen von *Puccinia Halosciadis* SYDOW in Lappland. — Ann. Bot. Soc. Vanamo 9:7: 13-14.

Lihnell, D., 1937: Fynd av *Endogone pisiformis* LINK och *Tuber maculatum* VITT. vid Uppsala. — Sv. Bot. Tidskr. 31: 150.

Lind, J., 1907: Liste over Svampe indsamlede under Svenska Botaniska Föreningens exkursion till Billingen 1907. — Sv. Bot. Tidskr. 1: 385-388.

— 1913: Danish Fungi as represented in the herbarium of E. ROSTRUP. — Copenhagen.

— 1928: Mikromyceter fra Åreskutan. — Sv. Bot. Tidskr. 22: 57-81.

— 1934: Studies on the geographical distribution of Arctic circumpolar Micromycetes. — K. Danske Vid. Selsk. Biol. Medd. 11:2.

Lindfors, Th., 1910: Einige Uredineen aus Lule Lappmark. — Sv. Bot. Tidskr. 4: 197-202.

— 1913: Aufzeichnungen über parasitische Pilze in Lule Lappmark. — Ibid. 7: 39-57.

Lindroth, I. J., 1902: Verzeichnis der aus Finland bekannten *Ramularia*-Arten. — Acta Soc. F. Fl. F. 23:3.

Linnaeus, C., 1745: Flora svecica. — Stockholmiae.

— 1755: Ditto. Ed. II. — Stockholmiae.

Liro, I. J., 1908: *Uredineae* fennicae. Finlands rostsvampar. — Bidr. känned. Finl. nat. o. folk 65.

— 1924: Die Ustilagineen Finnlands I. — Ann. Acad. Sci. Fenn. A:17.

— 1934—: Mycotheca fennica. (Hitherto 900 numbers.)

— 1938: Die Ustilagineen Finnlands II. — Ann. Acad. Sci. Fenn. A:42.

Litschauer, V., 1938: Beiträge zur Kenntnis der Corticiaceen Schwedens. — Sv. Bot. Tidskr. 32: 283-294.

— 1941 a: Neue schwedische Corticieen aus dem Herbar L. ROMELL's. — Ann. Myc. 38: 117-135.

— 1941 b: Über einige *Tomentella*-Arten aus Schweden und Macedonien. — Id: 360-378.

— 1944: Beitrag zur Kenntnis der Gattung *Aleurodiscus* (mit besonderer Berücksichtigung schwedischer Arten). — Ibid. 42: 1-23.

Ljungström, E., 1882: Små bidrag till svensk fungologi. — Bot. Not. 1882: 117-124.

Lohammar, G., 1953: *Limnomyces neglectus* n. gen. et n. sp., a parasite of *Elatine triandra*. — Sv. Bot. Tidskr. 47: 526-529.

Lund, A., 1930: A new species of *Plectrachelus* with remarks on this genus. — Bot. Tidsskr. 41: 240-243.

— 1934: Studies on Danish freshwater *Phycomycetes*... — K. Danske Vid. Selsk. Skr., Nat.-Math. Afd. 9:6:1.

Lund, N., 1846: Conspectus *Hymenomycetum* circa Holmiam crescentium... — Christianiae.

Lundell, S., 1934: Bidrag till Uppsalatraktens hymenomycetflora I. Vårdsätra naturpark. — K. Sv. Vet.-Akad. Skr. Naturskyddsär. 22.

— 1936: „Svamplokaler vid Femsjö." Ett efterlämnat manuskript av ELIAS FRIES. — Friesia 1: 259-286.

— 1937: Three undescribed vernal Agarics, *Mycena vernalis* H. V. POST in sched., *Clitocybe verna* EGELAND in sched., and *Entoloma vernum*. — Sv. Bot. Tidskr. 31: 186-195.

— & **Nannfeldt, J. A.,** 1934—: Fungi exsiccati suecici, praesertim upsalienses. (Hitherto 2300 numbers.)

Malmström, N., 1933: Senhöstens hattsvampar i frost och blida. — Mem. Soc. F. Fl. F. 9: 69-91.

— 1943: Agaricineer, för landet nya o. a. från södra Finland. — Ibid. 18: 77-83.

— 1946: För landet nya eller sällsynta svampar. — Ibid. 22: 16-17.

Mathiesen-Käärik, Aino, 1950: Über einige mit Borkenkäfern assoziierte Bläuepilze in Schweden. — Oikos 2: 275-308.

Mathiesen-Käärik, Aino, 1951: Einige neue *Ophiostoma*-Arten in Schweden. — Sv. Bot. Tidskr. 45: 203-232.

— 1953: Eine Übersicht über die gewöhnlichsten mit Borkekäfern assoziierten Bläuepilze in Schweden und einige für Schweden neue Bläuepilze. — Medd. Statens Skogsforskningsinst. 43:4.

Melin, E. & Nannfeldt, J. A., 1934: Researches into the blueing of ground wood-pulp. — Sv. Skogsvårdsfören. Tidskr. 32: 398-616.

Munk, A., 1948: *Pyrenomycetes* collected in the peninsula Mols, Jutland. — Dansk Bot. Ark. 12:11.

— 1952: New *Pyrenomycetes* from the herbarium of POUL LARSEN. — Ibid. 14:8.

— 1954: Notes on some *Hypocreales* recently found in Denmark. — Bot. Tidsskr. 51: 220-229.

Møller, F. H., 1950-51: Danish *Psalliota* Species. Preliminary studies for a monograph of the Danish *Psalliotae*. — Friesia 4: 1-60, 135-220.

Mörner, C. Th., 1937: Orientering över gasteromyceten *Mycenastrum Corium* (GUERS.) DESV. — Sv. Bot. Tidskr. 31: 206-214.

— 1939: Gasteromyceten *Tulostoma brumale* PERS. — Ibid. 33: 1-16.

Nannfeldt, J. A., 1928: Contributions to the mycoflora of Sweden 1. *Discomycetes* from Torne Lappmark. — Sv. Bot. Tidskr. 22: 115-139.

— 1931: Ditto 2. *Excipula sphaeroides* FR., some other *Discomycetes* on leaves of *Salix* and their conidial stages. — Ibid. 25: 1-31.

— 1936 a: Ditto 3. Some rare or interesting inoperculate *Discomycetes*. — Ibid. 30: 295-306.

— 1936 b: Tuberacén *Gyrocratera Ploettneriana* P. HENN. funnen i Sverige. — Friesia 1: 297-298.

— 1937: Contributions to the mycoflora of Sweden 4. On some species of *Helvella*... — Sv. Bot. Tidskr. 31: 47-66.

— 1938: Ditto 5. On *Peziza Catinus* HOLMSKJ. ex FR. and *P. radiculata* SOW. ex FR. — Ibid. 32: 108-120.

— 1942 a: The *Geoglossaceae* of Sweden (with regard also to the surrounding countries). — Ark. f. Bot. 30A:4.

— 1942 b: Contributions to the mycoflora of Sweden 6. On some white-excipled species of *Lachnum* RETZ. ex KARST. — Sv. Bot. Tidskr. 36: 287-300.

— 1946: En ny svensk hypogé, tryffeln *Geopora Schackii* P. HENN. — Friesia 3: 177-188.

— 1947: *Sphaeronaema rufum* FR., a misunderstood member of *Dacrymycetaceae*. — Sv. Bot. Tidskr. 41: 321-338.

— 1949: Contributions to the mycoflora of Sweden 7. A new winter Discomycete, *Urnula hiemalis* NANNF. n. sp., and a short account of the Swedish species of *Sarcoscyphaceae*. — Ibid. 43: 468-484.

— & **Eriksson, John,** 1952: On the genus *Costantinella* MATRUCHOT *(Hyphomycetes)*. — Ibid. 46: 109-128.

Nathorst-Windahl, T., 1943: Storsvampar i Bohuslän. — In: Bohuslän, landskapet vid västerhavet pp. 333-350. — Stockholm.

Nathorst-Windahl, T., 1945: Anmärkningsvärda fynd av hymenomyceter i Bohuslän och Västergötland. — Acta Horti Gothob. 16: 135-164.

— 1949: Anmärkningsvärda fynd av hymenomyceter i Bohuslän, Västergötland och Dalsland. — Bot. Not. 1949: 201-212.

Neergaard, P., 1945: Danish species of *Alternaria* and *Stemphylium*. Taxonomy, parasitism, economical significance. — Copenhagen. (Also diss.)

Nyberg, W., 1934: Några i Borgå och dess omnejd funna sällsyntare svamparter. — Mem. Soc. F. Fl. F. 10: 20-23.

— 1937: Ditto. — Ibid. 13: 49-52.

— 1943: Fynd av några mera sällsynta svamparter. — Ibid. 19: 16-18.

— 1946: Iakttagelser år 1945 om svampfloran i Grankulla och på några andra orter i Nyland. — Ibid. 22: 46-52.

Obel, P., 1910: Researches on the formation of oogonia in *Achlya*. — Ann. Myc. 8: 421-443.

— 1911: Undersøgelser over de Forhold, som betinger Forplantningen hos Saprolegniaceer. — Vid. Medd. Naturhist. For. 1910: 169-202.

Palm, Bj., 1908: Till kännedomen om Stockholmstraktens svampflora. — Sv. Bot. Tidskr. 2: 38-48.

— 1910: Nya bidrag till kännedomen om Stockholmstraktens svampflora. — Ibid. 4: (1)-(8).

— 1917 a: Svenska *Taphrina*-arter. — Ark. f. Bot. 15:4.

— 1917 b: Några svenska svamplokaler. — Sv. Bot. Tidskr. 11: 269-274.

— 1923: Nya lokaler för parasitsvampar från Stockholmstrakten. — Ibid. 17: 375-379.

Pearson, A. A. & Dennis, R. W. G., 1948: Revised list of British Agarics and Boleti. — Trans. Brit. Mycol. Soc. 31: 145-190.

Petersen, H. E., 1903: Notes sur les Phycomycètes observés dans les téguments vides des nymphes de Phryganées avec description de trois espèces nouvelles de Chytridinées. — Journ. de Bot. 17: 214-222.

— 1905: Contributions à la connaissance des Phycomycètes marins *(Chytrineae* FISCHER). — Overs. K. Danske Vid.-Selsk. Forh. 1905: 439-488.

— 1909: Studier over Ferskvands-Phykomyceter. — Bot. Tidsskr. 29: 345—440.

— 1910: An account of Danish Freshwater-*Phycomycetes*. — Ann. Myc. 8: 494-560.

Pilát, A., 1935: *Pleurotus* FRIES. — Atlas d. Champ. de l'Europe 2.

— 1946: Monographie des espèces européennes du genre *Lentinus* FR. — Ibid. 5.

— 1948: Monographie des espèces européennes du genre *Crepidotus* FR. — Ibid. 6.

Pilát, A. & Nannfeldt, J. A., 1954: Notulae ad cognitionem Hymenomycetum Lapponiae Tornensis (Sueciae). — Friesia 5: 6-38.

Rainio, A. T., 1926: *Uredineae* Lapponicae. — Ann. Bot. Soc. Vanamo 3: 239-267.

Ramsbottom, J. & Balfour-Browne, F. L., 1951: List of *Discomycetes* recorded from the British Isles. — Trans. Brit. Myc. Soc. 34: 38-137.

Ramsfjell, T., 1954: Lærsopper og poresopper på frukttrær og bærbusker. — Frukt og Bær 1954: 81-96.

Rauhala, A., 1951: *Puccinia Komarowi* TRANZSCHEL in Finnland gefunden. — Arch. Soc. Vanamo 6:1: 59-63.

— 1952: *Puccinia singularis* P. MAGNUS, neu för Finnland. — Ibid. 7:1: 43-44.

— 1953 a: *Puccinia arctica*n esiintymisestä Suomessa. — Ibid. 8:1: 43-44.

— 1953 b: Rostpilzfunde aus Finnland. — Id.: 98-101.

Raunkiaer, C., 1886: Danmarks Mycetozoer. — Medd. Bot. Foren. 9: 205.

— 1888: *Myxomycetes* Daniae. — Bot. Tidsskr. 17: 20-110.

Rautavaara, T., 1947: Suomen sienisato. — Forssa. (Also diss., Helsingfors.)

Ravn, F. K., 1900: Nogle *Helminthosporium*-Arter og de af dem fremkaldte Sygdomme hos Byg og Havre. — Bot. Tidsskr. 23: 101-322. (Also diss.)

Rennerfelt, E., 1946: Om rotrötan *(Polyporus annosus* FR.) i Sverige, dess utbredning och sätt att uppträda. — Medd. Statens Skogsforskningsinst. 35:8.

Retzius, A. J., 1779: Florae Scandinaviae prodromus... — Holmiae.

— 1795: Ditto. Ed. altera. — Lipsiae.

Robak, H., 1932: Investigations regarding fungi on Norwegian ground wood pulp and fungal infection at wood pulp mills. — Nyt Mag. f. Naturvid. 71: 185-330.

— 1952: Om saprofyttiske og parasittiske raser av lerkekreftsoppen, *Dasyscypha Willkommii* (HART.) REHM. — Medd. Vestl. Forstl. Forsøksstasjon 29: 117-204.

Roll-Hansen, F., 1940: Undersøkelser over *Polyporus annosus* FR., særlig med henblikk på dens forekomst i Det sønnafjelske Norge. — Medd. Norske Skogforsøksvesen 24 (= 7:1).

Romell, L., 1890-95: Fungi exsiccati praesertim scandinavici. (200 numbers.)

— 1911: *Hymenomycetes* of Lappland. — Ark. f. Bot. 11:3.

— 1912: Remarks on some species of the genus *Polyporus*. — Sv. Bot. Tidskr. 6: 635-644.

— 1925: Fruktträdens hattsvampar (Hymenomyceter). — Sveriges Pomol. Fören. Årsskr. 26: 43-56.

— 1926: Remarks on some species of *Polyporus*. — Sv. Bot. Tidskr. 20: 1-24.

Rostrup, E., 1883: Mykologiske Notitser fra en Rejse i Sverige Sommeren 1882. — Öfvers. Sv. Vet.-Akad. Förh. 40:4: 35-47.

— 1889: Mykologiske Meddelelser (2). — Bot. Tidsskr. 17: 228-237.

— 1890: *Ustilagineae* Daniae. — Bot. Foren. Festskr. 12/4 1890 pp. 117-168.

— 1891: *Taphrinaceae* Daniae. — Vid. Medd. Naturhist. For. 1890: 246-264.

— 1893: De i Danmark paa Leddyr optrædende Snyltesvampe. — Ibid. 1893: 78-95.

— 1904: Norske Ascomyceter. — (Christiania) Vid.-Selsk. Skr. I Math.-nat. Kl. 1904:4.

Rostrup, O., 1916: Bidrag til Danmarks Svampeflora I. — Dansk Bot. Ark. 2:5.

— 1935: Ditto II. — Ibid. 8:8.

Rydberg, R., 1949: Notes on the *Gasteromycetes* in Sweden I. — Sv. Bot. Tidskr. 43: 540-546.

Rytz, W., 1927: Einige Beobachtungen an Uredineen, gesammelt an den 4.I.P.E. — Veröff. Geobot. Inst. Rübel 4: 78-95.

Sandberg, G., 1940: Gasteromycetstudier. — Acta Phytogeogr. 13: 73-95.

Santesson, R., 1948: *Listerella paradoxa* JAHN och *Orcadella singularis* (JAHN) nov. comb., två för Sverige nya myxomyceter. — Sv. Bot. Tidskr. 42: 42-50.

— 1949: Svampar som leva på lavar. — Ibid. 43: 141-143.

Schulmann, O. von, 1955: Pilzstudien in Finnland. — Karstenia 3: 17-68.

Schäffer, J., 1939: Revision der *Russula*-Sammlung Romells... — Ark. f. Bot. 29A:15.

Singer, R. & Smith, A. H., 1947: Additional notes on the genus *Leucopaxillus*. — Mycol. 39: 725-736.

Skottsberg, C., 1936: *Anthurus australiensis*, en för Norden ny phalloidé. — Acta Horti Gothob. 11: 135-157.

Skovsted, V., 1950: The *Thelephoraceae* of Denmark I. The genus *Tomentella*. — C.R. Labor. Carlsberg, Sci. physiol. 25:1.

Sopp, O. Johan-Olsen, 1912: Monographie der Pilzgruppe *Penicillium*... I (q.p.). — (Kristiania) Vid.-Selsk. Skr., Math.-nat. Kl. 1912:11.

Sparrow, F. K., Jr., 1934: Observations on marine *Phycomycetes* collected in Denmark. — Dansk Bot. Ark. 8:6.

— 1943: Aquatic *Phycomycetes*, exclusive of the *Saprolegniaceae* and *Pythium*. — Univ. of Mich., Sci. ser. 15.

Starbäck, K., 1887: Bidrag till Sveriges Ascomycetflora. — Bot. Not. 1887: 206-210.

— 1888: Anteckningar öfver några svenska pyrenomyceter. — Bih. K. Sv. Vet.-Akad. Handl. 14:III:5.

— 1889: Ascomyceter från Öland och Östergötland. — Ibid. 15:III:2.

— 1890: Bidrag till kännedomen om Sveriges Ascomycetflora. — Ibid. 16:III:3.

— 1895: Discomyceten-Studien. — Ibid. 21:III:5.

Starbäck, K., 1896: *Sphaerulina halophila* (BOMM., ROUSS. et SACC.), en parasitisk pyrenomycet. — Ibid. 21:III:9.

— 1898: Några märkligare skandinaviska ascomycetfynd. — Bot. Not. 1898: 201-219.

Stenlid, G., 1947: Några anteckningar om Ålands svampflora. — Mem. Soc. F. Fl. F. 23: 82-90.

Stordal, J., 1952: Larger fungi from Hallingdal, Southern Norway. — Blyttia 10: 114-120.

— 1953: Notater om storsopp i Våle, Vestfold. — Friesia 4: 267-295.

— 1954 a: Storsopp på Vestlandet. — Våre Nyttevekster 49.

— 1954 b: *Clitocybe connata* (SCHUM. ex FR.) i Norge. — Friesia 5: 39-42.

— 1955 a: Storsopp i Nord-Norge. — Våre Nyttevekster 50: 1-4, 13-16.

— 1955 b: Utbredelsen av noen *Boletus*-arter i Norge. — Blyttia 13: 71-78.

Svensson, H. G., 1940: Anteckningar om Karlstadstraktens skivlingflora I.

— Vitsporingar: *Leucosporae*. — Medd. Värmlands Naturhist. Fören. 13.

— 1944: Ditto II. Broskskivlingar: *Marasmiae* och rödsporingar: *Rhodosporae*. — Ibid. 15:1.

— 1950: Ditto III. Släktet *Pholiota* (FR.) QUÉLET. — Ibid. 16: 1-32.

Theorin, P. G. E., 1879: *Hymenomycetes* Gothoburgenses. — Bot. Not. 1879: 119-129, 151-156.

— 1880: Adnotationes ad *Hymenomycetes* fahlunenses. — Falu h. lärov. inbjudn. t. årsexam. 1880.

— 1892: *Hymenomycetes* falunenses plenius enumerabuntur. — Bot. Not. 1892: 97-115.

Thesleff, A., 1920: Studier öfver basidsvampfloran i sydöstra Finland... — Bidr. känned. Finl. nat. o. folk 79:1.

Tolf, R., 1891: Mycologiska notiser från Småland 1 (q.p.). — Bot. Not. 1891: 211-220.

— 1897: Förteckning öfver parasitsvampar, iakttagne i trakten kring Jönköping. — Bot. Not. 1897: 222-229, 237-251.

Traaen, A. E., 1914: Untersuchungen über Bodenpilze aus Norwegen... — Nyt Mag. f. Naturvid. 52: 19-121.

Tuomikoski, R., 1953 a: Die *Lactarius*-Arten Finnlands. — Karstenia 2: 9-25.

— 1953 b: Notes on Finnish *Agaricales*. — Id.: 26-32.

Vang, J., 1945: *Typhula* species on agricultural plants in Denmark. — K. Vet.- og Landbohøjsk. Aarsskr. 1945: 1-46 (= Medd. 28, Plantepatol. Afd., K. Vet.- og Landbohøjsk., København.).

Vestergren, T., 1896: Bidrag till kännedomen om Gotlands svampflora. — Bih. K. Sv. Vet.-Akad. Handl. 22:III:6.

— 1897 a: Bidrag till en monografi öfver Sveriges sphaeropsideer. — Öfvers. K. Vet.-Akad. Förh. 54: 35-46.

Vestergren, T., 1897 b: Anteckningar till Sveriges ascomycetflora. — Bot. Not. 1897: 255-272.

— 1899-1916: Micromycetes rariores selecti praecipue scandinavici. (1800 numbers.)

— 1900: Eine arktisch-alpine *Rhabdospora*. — Bih. K. Sv. Vet.-Akad. Handl. 26:III:12:

— 1905: Ein bemerkenswerter Pyknidentypus *(Diplodina Rostrupii* n. sp.) — Ark. f. Bot. 5:11.

— 1907: *Discosia Artoceras* (TODE) FR., eine Leptostromatacee mit eigentümlichem Pyknidenbau. — Sv. Bot. Tidskr. 1:56: 60.

— 1912: Förteckning på de i Sverige hittills funna arterna af hyphomycet-släktena *Ramularia, Didymaria* och *Ovularia*. — Ibid. 6: 903-914.

Vleugel, J., 1908 a: Zur Kenntnis der auf der Gattung *Rubus* vorkommenden *Phragmidium*-Arten. — Sv. Bot. Tidskr. 2: 123-138.

— 1908 b: Bidrag till kännedomen om Umeåtraktens svampflora. — Id.: 304-324, 364-389.

— 1911: Zweiter Beitrag zur Kenntnis der Pilzflora in der Umgegend von Umeå. — Ibid. 5: 325-350.

— 1917: Zur Kenntnis der Pilzflora in der Umgegend von Umeå und Luleå 3. — Ibid. 11: 304-324.

Wakefield, Elsie M. & Bisby, G. R., 1941: List of *Hyphomycetes* recorded for Britain. — Trans. Brit. Myc. Soc. 25: 49-126.

Westling, R., 1911: Über die grünen Spezies der Gattung *Penicillium*. Versuch einer Monographie. — Ark. f. Bot. 11:1.

Wille, N., 1899: Om nogle Vandsoppe. — (Christiania) Vid.-Selsk. Skr., Math.-nat. Kl. 1899:3.

Woldmar, S., 1954: Om utbredningen i Norden av gråkremling, *Asterophora parasitica* (BULL. ex FR.) SING. — Sv. Bot. Tidskr. 48: 596-602.

ADDITIONS

During the long time that has passed since my lecture was given, a good many papers bearing upon our theme have been published. Several of them refer to investigations alluded to above as being in progress (e.g. JOHN ERIKSSON 1958 a-c; GUSTAVSSON 1959 a-b; LINDEBERG 1959; MUNK 1957; NANNFELDT & LINDEBERG 1957). Others treat branches of mycology hitherto neglected in Scandinavia (e.g. NILSSON 1958 b; SHEPHERD 1955, 1956; WILLÉN 1958). A selection of new papers as well some older omitted from my lecture are listed below.

Uppsala, in Dec. 1959.

Andersson, O., 1956: Three rare or little known bolets in Sweden. *Boletus pulverulentus* OPAT., *B. radicans* PERS. ex FR. and *Phylloporus rhodoxanthus* (SCHW.) BRES. — Friesia 5: 180-189.

Buchwald, N. F., 1957 a: *Microsporium canis* BODIN in dog, cat and man in Denmark. — Sydowia Beih. 1: 241-249.

— 1957 b: Bidrag til Bornholms Svampeflora. — Bornholms Naturhist. For. Jubilæumsskr. 1957: 11-26.

Christiansen, M. P., 1956: Two new species of *Corticiaceae* from Denmark. *Peniophora danica* sp. n. and *Corticium salicicola* sp. n. — Friesia 5: 207-211.

Christiansen, M. Skytte, 1954: *Nanostictis,* a new genus of scolecosporous *Discomycetes.* — Bot. Tidsskr. 51: 59-65.

— 1956: A new species of the form-genus *Lichenoconium* PETR. & SYD. (Fungi imperfecti), *L. xanthoriae* sp. n. — Friesia 5: 212-217.

Corner, E. J. H., 1956: A new European *Clavaria, Clavulinopsis septentrionalis* sp. nov. — Friesia 5: 218-220.

Eckblad, F.-E., 1955: The *Gasteromycetes* of Norway. The Epigaean Genera. — Nytt Mag. f. Bot. 4: 19-86.

— 1956: Some Operculate *Discomycetes* new to Norway. — Friesia 5: 223-230.

— 1957: Norges sarcoscyphaceer. — Blyttia 5: 3-13.

Eriksson, John, 1949 a: The Swedish species of the »*Poria vulgaris*-Group«. — Sv. Bot. Tidskr. 43: 1-24.

— 1949 b: Two new resupinate *Hymenomycetes* from Sweden. — Id.: 56-60.

— 1954: *Ramaricium* n. gen., a corticioid member of the *Ramaria* Group. — Ibid. 48: 188-198.

— 1958 a: Studies in the *Heterobasidiomycetes* and *Homobasidiomycetes-Aphyllophorales* of Muddus National Park in North Sweden. — Symb. Bot. Upsal. 16:1.

— 1958 b: Studies in *Corticiaceae (Botryohypochnus* DONK, *Botryobasidium* DONK, and *Gloeocystidiellum* DONK). — Sv. Bot. Tidskr. 52: 1-17.

— 1958 c: Studies of the Swedish *Heterobasidiomycetes* and *Aphyllophorales* with special regard to the family *Corticiaceae.* — Uppsala. (Diss., Uppsala.)

Gustavsson, A., 1959 a: Studies on Nordic Peronosporas I. Taxonomic revision. — Op. Bot. (Lund) 3:1.

— 1959 b: Ditto II. General Account. — Ibid. 3:2.

Hansen, Lise, 1956: Two polyporaceous fungi with merulioid hymenophore. *Poria taxicola* (PERS.) BRES. and *Polyporus dichrous* FR. ex FR. — Friesia 5: 251-256.

Hauerslev, K., 1956: Om Fund af Judasøre *(Hirneola auricula Judae* (L.) BERK.) i Korsør og nærmeste Omegn. — Friesia 5: 266-270.

Hellmers, E., 1958: Four wilt diseases of perpetual-flowering carnations in Denmark. *Pseudomonas caryophylli, Pectobacterium parthenii*

var. *dianthicola, Phialophora cinerescens, Fusarium spp.* — Dansk Bot. Ark. 18:2. (Also diss., Copenhagen.)

Hintikka, E. V., 1957: Über die finnischen Arten und Varietäten der Gattung *Xeromphalina* KÜHNER & MAIRE. — Karstenia 4: 5-9.

Holm, L., 1957: Études taxonomiques sur les Pléosporacées. — Symb. Bot. Upsal. 14:3. (Also diss., Uppsala.)

Hultén, E., 1957: *Trichaster melanocephalus* CZERN. funnen på Öland. — Bot. Not. 111: 390-393.

Häyrén, E., 1956: Die in Finnland bisher gefundenen Wasserpilze. — Friesia 5: 264-265.

Jörgensen, H. A., 1956: *Monascus ruber* VAN TIEGH. demonstrated in Denmark. — Friesia 5: 274-277.

Jørstad, I., 1954: The rusts on *Cyperaceae, Iridaceae* and *Juncaceae*. — Skr. Norske Vid.-Akad. Oslo, I Mat.-Nat. Kl. 1954:3.

— & Nannfeldt, J. A., 1958: Additions and corrections to »Enumeratio Uredinearum Scandinavicarum«. — Bot. Not. 111: 306-318.

— & Ramsfjell, T., 1957: The rust fungus *Puccinia hieracii* on cultivated *Doronicum orientale* in Scandinavia. — Nytt Mag. f. Bot. 5: 33-35.

Kari, L. E., 1957: Fungi exsiccati fennici 1-500. — Schedae also in: Ann. Univ. Turku. A:II:23.

Klinge, A. B., 1956: Beiträge zur Pilzflora Jütlands. — Friesia 5: 284-288.

Lange, M., 1956 a: Danish hypogeous Macromycetes. — Dansk Bot. Ark. 16:1.

— 1956 b: *Pyrenomycetes* parasitic in hypogeous fungi. — Friesia 5: 289-292.

Larsson, B. M. P., 1958: Gasteromycetstudier I. *Geastrum triplex* JUNGH. funnen på Kinnekulle. — Sv. Bot. Tidskr. 52: 284-290.

Lindeberg, Brita, 1959: *Ustilaginales* of Sweden (exclusive of the Cintractias on *Caricoideae)*. — Symb. Bot. Upsal. 16:2.

Lund, Aa., 1956: *Sporobolomyces* and other yeasts on grains of barley. — Friesia 5: 297-302.

Munk, A., 1957: Danish *Pyrenomycetes*. A preliminary flora. — Dansk Bot. Ark. 17:1.

Müller, D., 1958: *Lycogala flavo-fuscum* in Denmark. — Friesia 5: 309-311.

Möller, F. H., 1956: Two little-known Danish mushrooms: *Boletus fragrans* VITT. and *Boletus edulis* var. *citrinus* PELTEREAU. — Friesia 5: 312-316.

Nannfeldt, J. A., 1956: *Polyporus hispidus* (BULL.) FR. funnen på Öland. — Friesia 5: 317-318.

— & Lindeberg, Brita, 1957: Taxonomic studies on the ovariicolous species of *Cintractia* on Swedish *Caricoideae* 1. Introduction. Some general considerations. *Cintractia subinclusa* and similar echinosporous species. — Sv. Bot. Tidskr. 51: 493-520.

Nathorst-Windahl, T., 1956: Zur Verbreitung der *Agaricales* in den Wäldern des südwestlichen Schwedens. — Friesia 5: 319-324.

Nilsson, S., 1957: A new Danish fungus. *Dinemasporium marinum.* — Bot. Not. 110: 321-324.

— 1958 a: Some notes on *Phlogiotis helvelloides* (DC. ex FR.) MARTIN and its distribution in Sweden. — Bot. Not. 111: 424-430.

— 1958 b: On some Swedish freshwater *Hyphomycetes.* Preliminary notes. — Sv. Bot. Tidskr. 52: 291-318.

Nyberg, W., 1956: *Boletinus asiaticus* Sing. i Finland. — Friesia 5: 340.

Paldrok, H., 1953: On the variability and classification of Dermatophytes. — Acta Dermato-venerol. 33: 1-50.

Petrak, F., 1956: Zwei neue Kleinpilze der schwedischen Flora. — Sydowia 10: 255-257.

Ramm, W., & Stordal, J., 1955: Gull-rørsopp, *Boletus auriporus* PECK 1872, funnet i Norge. — Blyttia 13: 96-100.

Rauhala, A., 1953 c: *Aecidium*-Funde. — Karstenia 2:46.

— 1953 d: *Puccinia Veratri* NIESSL in Ostfennoskandien. — Id.:47.

— 1955: Für die pflanzengeographischen Provinzen Süd- und Nord-Savo neue Rostpilze. — Arch. Soc. Vanamo 9 (Suppl.): 278-282.

— 1957: Kotimaisia härmäsienilöytöjä sekä tähänastiset tiedot härmäsienilajien kasvimaakunnittaisesta levinneisyydestä maassamme. Mehltaupilzfunde aus Finnland mit Berücksichtigung der bisherigen Verbreitungsangaben. — Karstenia 4: 14-26.

Robak, H., 1956: Some fungi occurring on died-back tops and branches of *Picea abies* and *Abies spp.* in Western Norway. — Friesia 5: 366-389.

Santesson, R., 1956: *Capillipes cavorum* g. nov., sp. nov., a new terricolous inoperculate Discomycete from Swedish Lappland. — Friesia 5: 390-395.

Schulmann, O. von, 1950: Seltene Pilze. — Ekenäs. (n. v.)

— 1957: Pilzstudien in Finnland II. — Karstenia 4: 27-62.

Shepherd, Andrey M., 1955: *Harposporium crassum* sp. nov. — Trans. Brit. Myc. Soc. 38: 47-48.

— 1956: A short survey of Danish nematophagous fungi. — Friesia 5: 396-408.

Skovsted, A., 1956 a: The *Thelephoraceae* of Denmark II. The genus *Thelephora* FR. — C. R. Labor. Carlsberg, Sci. Physiol. 25:14.

— 1956 b: Ditto III. The *Stereaceae.* — Ibid. 25:17.

Stordal, J., 1956: Distribution of *Tricholoma gambosum* (FR.) GILL. and *Boletus granulatus* L. ex FR. in Norway. — Friesia 5: 409-416.

Vallin, H., 1956: *Tricholoma verrucipes* FR. eller *Clitocybe verrucipes* (FR.) MAIRE funnen i Hälsingborgstrakten, Sydsverige. — Friesia 5: 420-424.

Willén, T., 1958: Conidia of aquatic *Hyphomycetes* amongst plankton algae. — Bot. Not. 111: 431-435.

Woldmar, S., 1955: *Solenia crocea* Karst. — en förbisedd svampart. — Friesia 5: 96-98.

— 1956: Några västsvenska svampfynd. — Id.: 425-432.

FRIESIA . Bind VI . Hefte 3 . 1959

MEDDELELSER

fra

FORENINGEN TIL SVAMPEKUNDSKABENS FREMME.

50-ÅRS JUBILÆET
DEN 30. SEPTEMBER — DEN 4. OKTOBER 1955.

Allerede på et Møde den 10. Februar 1954 begyndte Bestyrelsen at drøfte, hvorledes Foreningens forestående 50-Års Jubilæum den 1. Oktober 1955 skulde festligholdes, og det vedtoges bl. a. at oprette et særligt Fond til Bestridelse af forskellige Udgifter i Forbindelse med Jubilæet. Midlerne til dette Jubilæumsfond skulde i første Række udgøres af 2000 Kr., som hævedes af „Flora Agaricina Danica-Fondet", og derefter suppleres med 20% af den Andel af Indtægterne, som vilde tilfalde Foreningen ved Salget af „Flora Agaricina Danica" i 1954 og 1955. På Bestyrelsesmødet den 10. Februar det følgende År (1955) nedsattes en Festkomité bestående af Bestyrelsen og følgende Medlemmer af Foreningen: Amanuensis E. HELLMERS, Postmester J. P. JENSEN, Dr. phil. MORTEN LANGE, Overlærer F. H. MØLLER og Professor D. MÜLLER, og på et Par Møder i April fastlagde Festkomiteen Retningslinierne for de forskellige Arrangementer, der skulde finde Sted i Forbindelse med Jubilæet. I det følgende skal der kort gøres Rede for Hovedpunkterne i dets Forløb.

Jubilæet fik sin særlige festlige Karakter derved, at en Række udenlandske Mykologer var blevet indbudt, og det kom herved faktisk til at forme sig som en mindre international mykologisk Kongres. Et Prospekt om Jubilæet, affattet på Engelsk, blev udsendt i Maj-Juni til ca. 80 udenlandske Mykologer, af hvilke en snævrere Kreds fik en speciel Indbydelse og modtog økonomisk Støtte fra Jubilæumsfondet. Ialt deltog 27 Udlændinge, nemlig: Frk. KARIN ASCHAN (Sverige), W. BÖTTICHER med Frue (Tyskland), R. W. G. DENNIS (England), F.-E. ECKBLAD (Norge), JOHN ERIKSSON (Sverige), G. L. VAN EYNDHOVEN (Holland), Miss LILIAN E. HAWKER (England), S. J. HUGHES (Cana-

da), C. T. Ingold (England), I. Jørstad (Norge), Madame Le Gal (Frankrig), M. Locquin (Frankrig), K. Lohwag (Østrig), R. A. Maas Geesteranus med Frue (Holland), M. Moser (Østrig), J. A. Nannfeldt (Sverige), T. Nathorst-Windahl (Sverige), A. Pilát (Tjekkoslovakiet), B. E. Plunkett (England), Frau Liesel Schäffer (Tyskland), J. Stordal (Norge), R. Tuomikoski (Finland), John Webster med Frue (England) og S. Woldmar (Sverige). E. J. H. Corner (England), R. Kühner (Frankrig), H. S. C. Huijsman (Holland) og Seth Lundell (Sverige), som alle var specielt indbudte, meddelte, at de desværre var forhindrede i at deltage. De udenlandske Deltagere repræsenterede således 10 Nationer, nemlig Canada (1), England (6), Finland (1), Frankrig (2), Holland (3), Norge (3), Sverige (5), Tjekkoslovakiet (1), Tyskland (3) og Østrig (2). Blandt Deltagerne var Formændene for de mykologiske Foreninger i England, Finland, Frankrig, Holland og Norge. Fra dansk Side deltog godt og vel 50 af Foreningens Medlemmer i de forskellige Arrangementer, bortset fra Svampeudstillingen, der besøgtes af et langt større Antal.

Jubilæumsarrangementerne strakte sig over 5 Dage, fra Fredag den 30. September til Tirsdag den 4. Oktober (begge Dage iberegnet).

Jubilæet indledtes med Åbningen af en Svampeudstilling i Det kgl. Haveselskabets Have. Den åbnede Fredag Kl. 14^{00} og lukkede Søndag den 2. Oktober Kl. 20^{00}.

Lørdag den 1. Oktober benyttede de udenlandske Gæster til Besøg på Udstillingen og på forskellige Institutioner som Botanisk Museum, Botanisk Laboratorium, Landbohøjskolens plantepatologiske Afdeling, Statens forstlige Forsøgsvæsen m. m. Om Aftenen var de fleste inviteret til private Sammenkomster hos danske Mykologer.

Søndag den 2. Oktober afholdtes Kl. 13—17 en mindre Svampeekskursion til Gribskov, og Kl. 18 samledes alle Ekskursionens Deltagere og en Del andre, ialt 71, til en Jubilæumsmiddag på Slotspavillonen i Hillerød.

Mandag den 3. Oktober indledtes med en Ekskursion til Jægersborg Dyrehave, hvor de udenlandske Mykologer fik rig Lejlighed til at gøre sig fortrolig med en gammel dansk Bøgeskov. Ekskursionen sluttede med Frokost på Restaurant „Fortunen". Om Aftenen Kl. 20 afholdtes i Auditoriet på Botanisk Laboratorium et videnskabeligt Møde under stor Deltagelse af Foreningens Medlemmer. Ved Mødet blev følgende tre Foredrag afholdt:

Professor C. T. Ingold, London: Spore Discharge in Pyrenomycetes.

Professor J. A. NANNFELDT, Uppsala: The Mycofloristical Exploration of Scandinavia, especially Sweden (med Lysbilleder).

M. l'Ingénieur M. LOCQUIN, Paris: L'observation au microscope électronique des structures fines des Myxomycètes (med Lysbilleder).

Alle tre Foredrag efterfulgtes af en livlig Diskussion. Foredragene er aftrykt in extenso i nærværende Hefte.

Tirsdag den 4. Oktober var der om Formiddagen Ekskursion til Tisvilde Hegn, hvor de fremmede Deltagere stiftede Bekendtskab med Svampefloraen i en dansk Nåleskov, plantet på gammelt Klitterræn. Ekskursionen sluttede med Frokost på Tisvilde Kro. Samme Dags Eftermiddag Kl. 17 afsluttedes Jubilæet ved en lille festlig Sammenkomst på Botanisk Laboratorium.

I det følgende vil Svampeudstillingen, Jubilæumsmiddagen og Ekskursionerne blive omtalt nærmere.

Jubilæet fejredes endvidere ved Udsendelse af Hefte 2 af Bind 5 af „Friesia", der fremtræder som et Festskrift til Minde om den store svenske Mykolog ELIAS FRIES, efter hvem Foreningens Tidsskrift er opkaldt. Festskriftet, der også findes som Særtryk, indeholder en rigt illustreret, kommenteret Oversættelse til Engelsk af ELIAS FRIES' Selvbiografi, som han udgav i 1857 på Latin under Titlen „Historiola studii mei mycologici" i Vol. I af „Monographia Hymenomycetum Sueciae". Herigennem er Selvbiografien, der er Hovedkilden til FRIES' Liv, blevet gjort alment tilgængelig for den mykologiske Verden.

JUBILÆUMSUDSTILLINGEN DEN 30. SEPTEMBER—DEN 2. OKTOBER 1955.

Jubilæumsudstillingen afholdtes som de tidligere Svampeudstillinger i Forening med Det kgl. danske Haveselskab, der elskværdigst havde stillet Pavillonen i Haveselskabets Have til Rådighed. Af Hensyn til Besøget af de udenlandske Mykologer indskrænkedes Udstillingen til 3 Dage og åbnede først Fredag den 30. September Kl. 14^{00}. Haveselskabet havde i Anledning af Jubilæet gjort sig særlig Umage for på en smuk og tiltalende Måde at pynte Udstillingslokalet.

De varme, tørre Sommermåneder Juli og August havde ikke undladt at sætte deres Præg på Svampefloret, hvad det forholdsvis ringe Udbytte af de to før Udstillingen ($^{28}/_{8}$ og $^{11}/_{9}$) stedfundne Ekskursioner tydeligt havde vist. Da der tilmed ikke var større Udsigt til, at der i den nærmeste Fremtid vilde falde Regn, som kunne lokke

Svampene frem, var det ikke uden en vis Bekymring, at Festkomiteen imødeså Jubilæet og da navnlig den påtænkte Svampeudstilling.

Der faldt faktisk ikke meget Regn i den sidste Halvdel af September, men en kraftig Byge den 15. gjorde sine Virkninger, således at det alligevel lykkedes ved et energisk Indsamlingsarbejde fra mange Medlemmers Side at få stablet en ret anselig Udstilling på Benene. Artsantallet nåede efterhånden op på 215 Arter, et Tal, der i høj Grad vakte de udenlandske Mykologers Forbavselse, fordi Svampefloret i deres respektive Hjemlande var om muligt endnu ringere end her i Landet.

Nedenfor følger en fuldstændig Fortegnelse over de udstillede Arter. Denne er for en væsentlig Del udarbejdet på Grundlag af Postmester J. P. JENSEN's Optegnelser. Af de sjældnere Arter er der Grund til at fremhæve *Boletus versicolor* (Syn. *B. rubellus)*, *B. viscidus; Collybia acervata* (Syn. *C. erythropus* (PERS.) LANGE); *Cortinarius sulphurinus, C. Junghuhnii; Gomphidius gracilis; Lepiota subincarnata; Polyporus Pfeifferi* (Syn. *P. cupreo-laccatus); Psathyra fatua; Rhizina inflata; Russula urens* ROM. ap. J. SCHFF.; *Volvaria speciosa.* Flere af de nævnte Arter, bl. a. *Russula urens,* blev bestemt i Samråd med de fremmede Mykologer.

Skønt Foreningen annoncerede kraftigere i Pressen end nogensinde, besøgtes Udstillingen kun af 1018 betalende Gæster, hvoraf langt de fleste, nemlig 702, kom om Søndagen. Det ringe Besøg skyldes dels, at Udstillingen kun var åben i 3 Dage, dels navnlig, at den samtidige store britiske Udstilling ganske lagde Beslag på Folks Opmærksomhed. Da Udgifterne i Forbindelse med Udstillingen var ret anselige, bl. a. Annoncering for Kr. 345,25, og Entreen kun var 1 Kr., er det ikke mærkeligt, at den gav Underskud; dette blev dog kun på Kr. 112,85. Se i øvrigt S. 232.

Myxomycetes

Fuligo septica
Lycogala epidendron

Ascomycetes

Helvella crispa, lacunosa
Hypocrea citrina
Leotia lubrica
Peziza hemisphaerica, leporina, scutellata
Rhizina inflata
Spathularia flavida
Ustulina maxima

Heterobasidiomycetes

Calocera viscosa

Homobasidiomycetes-Aphyllophorales

Daedalea gibbosa, quercina
Fistulina hepatica
Hydnum auriscalpium, repandum
Lenzites saepiaria
Merulius rufus
Polyporus abietinus, adustus, albidus, annosus, applanatus, dryadeus, fomentarius, giganteus,

Polyporus lucidus, odoratus, Pfeifferi, Schweinitzii, sulphureus, varius
Stereum bicolor
Thelephora terrestris

Homobasidiomycetes-Agaricales

Amanita aspera, mappa, muscaria, pantherina, virosa, vaginata var. *fulva, vaginata* var. *plumbea*
Armillaria mellea
Bolbitius vitellinus
Boletus badius, calopus, chrysenteron, edulis, elegans, granulatus, miniatoporus, piperatus, rufus, scaber, strobilaceus, subtomentosus, versicolor, viscidus
Cantharellus aurantiacus, cibarius
Clitocybe gigantea, infundibuliformis, odora
Clitopilus prunulus
Collybia acervata (Syn. *C. erythropus* (PERS.) LANGE), *badia* (LUCAND) LANGE, *cirrhata, dryophila, maculata, mucida, platyphylla, radicata, tuberosa*
Coprinus atramentarius, comatus, insignis, micaceus, picaceus, plicatilis
Cortinarius armillatus, cinnamomeus, elatior, Junghuhnii, subpurpurascens, sulphurinus
Crepidotus mollis, variabilis
Gomphidius glutinosus, gracilis
Hebeloma sacchariolens
Hygrophorus cantharellus, ceraceus, chrysodon, eburneus, olivaceo-albus, penarius, psittacinus
Hypholoma capnoides, fasciculare, hydrophilum, sublateritium
Inocybe dulcamara, fastigiata, geophylla, sindonia
Laccaria laccata var. *amethystina, laccata* var. *rosella*
Lacrymaria lacrymabunda
Lactarius blennius, deliciosus, glyciosmus, pyrogalus, quietus, rufus, subdulcis, torminosus, turpis, uvidus
Lentinus cochleatus
Lepiota ignipes (det. LOCQUIN), *procera, rhacodes, subincarnata, umbonata*
Marasmius alliaceus, androsaceus, foetidus, rotula, scorodonius, urens
Mycena crocata, galericulata, galopus, haematopus, inclinata, pelianthina, pura, sanguinolenta
Nyctalis parasitica
Omphalia fibula, umbellifera, umbilicata
Paxillus acheruntius, atrotomentosus, involutus
Pholiota brunneola, caperata, flammans, mutabilis, radicosa, spectabilis
Pleurotus corticatus
Pluteus cervinus, murinus BRES.
Psalliota campestris, dulcidula, edulis, silvatica, silvicola, subperonata, xanthoderma
Psathyra fatua
Psathyrella gracilis
Psilocybe semilanceata
Russula aeruginea, alutacea ss. LANGE, *atropurpurea* non LANGE, *claroflava, delica, densifolia, emetica, gracillima, graveolens, grisea, lepida, lutea, Mairei, nigricans, ochroleuca, paludosa, parazurea, Quéletii, rosea, sardonia, solaris, urens* ROM. ap. J. SCHFF., *Velenovskyi, venosa* ss. LGE. *(nitida), vesca, veternosa, xerampelina*
Stropharia coronilla, semiglobata
Tricholoma album, conglobatum, flavobrunneum, lascivum, melaleucum, myomyces, rutilans, sulphureum
Tubaria furfuracea
Volvaria speciosa

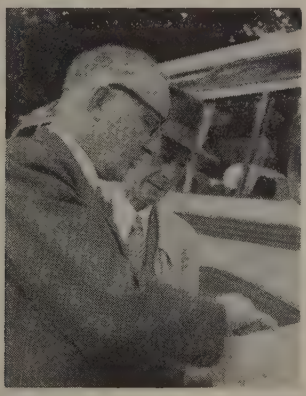
Homobasidiomycetes-Gasteromycetales

Calvatia caelata, maxima (gigantea), saccata
Crucibulum vulgare
Cyathus striatus
Geaster fimbriatus
Lycoperdon perlatum, pyriforme
Phallus impudicus
Scleroderma aurantium, verrucosum

JUBILÆUMSEKSKURSIONERNE.
2.—4. OKTOBER 1955.

Ved Udarbejdelsen af Artslisterne for de følgende tre Ekskursioner har jeg haft god Støtte i de Notater, som flere af de udenlandske Mykologer var så venlige at tilsende Foreningen efter deres Hjemkomst fra Jubilæet. Notater er således modtaget fra R. W. G. DENNIS (væsentlig *Discomycetes)*, JOHN ERIKSSON (resupinate Arter), LILIAN E. HAWKER, IVAR JØRSTAD *(Ascomycetes* og *Uredinales)*, R. A. MAAS GEESTERANUS (væsentlig *Hymenomycetes)*, MEINH. MOSER *(Agaricales,* især *Cortinarius*-Arter) og JOHN WEBSTER *(Ascomycetes)*. Arterne på de tilsendte Notater er alle indført i de efterfølgende Artsfortegnelser, bortset fra Dr. JØRSTAD's, der er aftrykt i en selvstændig Fortegnelse. Foreningen vil gerne her benytte Lejligheden til at rette en varm Tak til de ovennævnte Mykologer for den Interesse, de har udvist ved at tilsende Foreningen deres mykologiske Notater. Fra dansk Side må navnlig nævnes en omfattende Liste over resupinate Arter, affattet af Kaptajn M. P. CHRISTIANSEN og Tandlæge K. HAUERSLEV.

Søndag den 2. Oktober 1955. Ekskursion til G r i b s k o v. 65 Deltagere (incl. 26 Udlændinge). Kl. 12^{30} startede man fra Studenterforeningen, H. C. Andersens Boulevard, i to Turistbusser og kørte ad Strandvejen til Helsingør, hvor der gjordes et kort Ophold ved



Ekskursion til Gribskov 2.10.1955.
N. F. BUCHWALD og Ø. WINGE konfererer. —
Fot. MEINH. MOSER.

Kronborg Slot for at give de udenlandske Mykologer Lejlighed til at få et Glimt af Slottet at se. Derpå fortsatte man ad Helsingør-Hillerød Landevejen til „Slotspavillonen" i Hillerød, hvortil man ankom Kl. 13^{45}. Her sluttede yderligere nogle Deltagere sig til, og efter et Kvarters Ophold kørte man ad Helsingevejen op i Gribskov til Rævebakkevej, hvor man stod af Busserne. Der botaniseredes nu i næsten 3 Timer i Skoven, overvejende i det trekantede Område mellem Helsingevej og Odderdamsvej. Kl. 17^{00} steg Deltagerne atter til Vogns og kørte tilbage til „Slotspavillonen", hvor man samledes til Jubilæumsmiddagen Kl. 18^{00}.

Ekskursionen fandt Sted i strålende Vejr, men Svampefloret var som ventet desværre meget sparsomt og tørkepræget. Den fremherskende Svampeart var *Cantharellus aurantiacus*. Hyppige var også *Boletus badius* og *B. edulis*, og på mange Granstød voksede *Lenzites saepiaria*. Nedenfor følger en Fortegnelse over de kun 47 noterede Arter, af hvilke endda kun 17 hører til *Agaricales*. Nye for den danske Flora er vist *Corticium Pearsonii* (Bourd.) (det. J. Eriksson) og *Hyaloscypha Stevensonii* (B. et Br.) Nannfeldt., som fandtes på *Picea abies* (det. Dennis).

Myxomycetes

Comatricha nigra Schroet. (Løvtræ) (det. M. P. Chr.)

Ascomycetes

Elaphomyces muricatus (det. Hawker)
Hyaloscypha Stevensonii (B. et Br.) Nannf. *(Picea,* det. Dennis)
Nectria peziza (Tode ex Fr.) Fr. *(Fagus,* det. Dennis)

Heterobasidiomycetes

Calocera cornea, viscosa

Homobasidiomycetes-Aphyllophorales

Botryobasidium subcoronatum (v. H. et L.) Donk (det. Erikss.)
Ceratobasidium cornigerum (Bourd.) Rogers (det. Erikss.)
Coniophora arida (Fr.) Karst. *(Picea)*
Corticium botryosum Bres. *(Botryobasidium „vagum"* coll., det. Erikss.), *confluens* (Fr.) Fr. *(Fagus), evolvens* (Fr.) Fr. *(Picea), fumosum* (Fr.) Fr., *Pearsonii* Bourd. (sjæld., det. Erikss.)
Gloeocystidium citrinum (Pers.) Lundell *(Picea), pallidum* (Bres.) v. H. et L., *Sernanderi* Litsch. *(Fagus)*
Lenzites saepiaria (Picea abies)
Odontia bicolor (A. et S.) Bres. *(Picea), hydnoides* (Cke. et Mass.) v. H. *(Fagus)*
Pellicularia subcoronata (v. H. et L.) Rogers, *vaga* (Berk. et Curt.) Rogers
Peniophora alutaria Burt., *incarnata* (Pers. ex Fr.) Karst., *pallidula* (Bres.) Bres., *pithya* (Pers.) Erikss. *(Picea), setigera* (Fr.) v. H. et L. (det. Erikss.)
Poria sanguinolenta (Picea, det. Geesteranus)
Ptychogaster albus (Picea abies)
Thelephora terrestris (Pteridium aquilinum)

Homobasidiomycetes-Agaricales

Amanita muscaria, vaginata var. *plumbea*
Boletus badius, edulis, piperatus
Cantharellus aurantiacus
Coprinus lagopus
Cortinarius cinnamomeus ss. LGE.
Flammula (Gymnopilus) hybrida (det. MOSER)
Hypholoma cotoneum
Lentinus (Lentinellus) cochleatus
Mycena vulgaris, zephirus
Psilocybe uda
Russula aeruginea, emetica
Tubaria inquilina

Mandag den 3. Oktober 1955. Ekskursion til J æ g e r s b o r g D y r e h a v e. 42 Deltagere, hvoraf 24 Udlændinge. Deltagerne tog Kl. 9^{14} med Toget fra Københavns Hovedbanegård til Klampenborg, hvortil man ankom Kl. 9^{36}.

Under Postmester J. P. JENSEN's kyndige Førerskab gik man nu fra „Røde Port" ad Fortunvejen først til Peter Lieps Hus og derfra over „De blå Bomme" og Ulvedalene til „Fortunen" og fik herved Lejlighed til at stifte Bekendtskab med en Række af de for Dyrehaven karakteristiske og sjældne Storsvampe. Blandt disse kan nævnes følgende:

Hydnum (Hericium) coralloides i hul Stamme af *Fagus silvatica*. Om denne Art udspandt der sig til Danskernes Overraskelse en livlig Diskussion, idet et Par af de udenlandske Mykologer vilde mene, at

Ekskursion til Jægersborg Dyrehave 3.10.1955.
Fra venstre: M. LOCQUIN, P. GRØNTVED, R. W. G. DENNIS, A. PILÁT, R. TUOMIKOSKI, Fru LIESEL SCHÄFFER, KN. CHRISTENSEN (med Ryggen til), K. BJØRNEKÆR, MAAS GEESTERANUS (på Hug), K. HAUERSLEV og KJELD BÜLOW. — Fot. MEINH. MOSER.

det var *H. (Hericium) laciniatum* (som dog ikke vides at være fundet i Danmark). Endvidere *Hydnum (Steccherinum) septentrionale* i flere Knipper på levende Stammer af *Fagus silvatica* på det velkendte Sted nær Ulvedalene; *Lentinus ursinus* i talrige Eksemplarer på *Fagus; Lenzites saepiaria* på brandlidt Nåletræstolpe; *Phylloporus rhodoxanthus,* en halv Snes Individer, desværre alle angrebne af *Sepedonium chrysospermum; Polyporus (Ganoderma) lucidus* på Stød af *Abies alba, P. (Ganoderma) Pfeifferi (cupreo-laccatus)* ved Basis af gamle Stammer af *Fagus* og *P. sulphureus,* meget prangende Eksemplarer på *Alnus glutinosa.*

Størst Henrykkelse hos vore udenlandske Gæster vakte en sjælden smuk Gruppe af vor „nationale" Svamp *Pholiota Vahlii (Ph. aurea),* der voksede ved Peter Lieps Hus nær Fortunvejen. Næppe mange af Gæsterne, om nogen, kendte denne sjældne Svamp fra deres Hjemland, og den blev da også fotograferet af de fleste.

Der noteredes ialt 105 Svampearter, hvoraf kun 42, altså kun $^2/_5$, hører til *Agaricales.* Flere af Arterne må betragtes som nye for Danmark, således *Odontia breviseta* KARST. (det. J. ERIKSSON) og den meget sjældne *Peniophora guttulifera* (KARST.) SACC., der samledes af både JOHN ERIKSSON og M. P. CHRISTIANSEN.

Ekskursionen sluttede med varm Frokost på „Fortunen" (Kl. 12^{30}-14^{00}). Derpå afhentedes Deltagerne i Busser, som kørte dem til Klampenborg St., hvorfra man Kl. 14^{23} tog Toget tilbage til Nørreport. De fleste af Deltagerne samledes derefter på Botanisk Laboratorium, hvor man i nogle Timer beså og drøftede Formiddagens Svampeudbytte.

Et stille, mildt Vejr, delvis med Solskin, bidrog i høj Grad til, at Ekskursionen fik et vellykket Forløb.

Om Aftenen Kl. 20^{00} samledes man atter på Botanisk Laboratorium til videnskabeligt Møde med Foredrag af Professor J. A. NANNFELDT, Professor C. T. INGOLD og Ingeniør M. LOCQUIN. Foredragene er aftrykt in extenso i nærværende Hefte.

Nedenfor følger en fuldstændig Liste over de på Ekskursionen noterede Svampearter.

Ascomycetes

Calycella (Helotium) citrina (HEDW. ex FR.) QUÉL. *(Fagus)* (det. DENNIS)
Coryne sarcoides
Hydnotrya Tulasnei (det. HAWKER)
Hypocrea rufa (Fagus)
Hypoxylon fragiforme (Fagus)
Lasiosphaeria hispida
Nectria peziza (Fagus) (det. DENNIS)

Peziza (Aleuria) micropus (Fagus), (det. LE GAL)
Phaeobulgaria inquinans
Ustulina maxima
Xylaria hypoxylon, polymorpha

Basidiomycetes-Aphyllophorales

Coniophora arida (FR.) KARST. *(Picea)*
Corticium bombycinum (SOMMERF. ex FR.) BRES. (det. ERIKSS.), *confine* B. & G. *(Fagus)*, *confluens* (FR.) FR. *(Fagus)*, *lividum* (PERS.) FR. *(Fagus)*, *portentosum* B. et C. (det. ERIKSS.), *sambuci* (PERS.) FR., *tulasnelloideum* v. H. et L. (det. ERIKSS.)
Daedalea quercina
Fistulina hepatica
Gloeocystidium albostraminium BRES. *(Fagus)*, *lactescens* (BERK.) v. H. et L., *Sernanderi* LITSCH. *(Fagus)*
Hydnum (Hericium) coralloides (hul Stamme af *Fagus)*, *(Stecherinum) septentrionale (Fagus)*
Lenzites saepiaria (brændt Stolpe af *Picea)*
Mycoacia uda (FR.) DONK (det. ERIKSS.)
Mycoleptodon ochraceus (PERS.) PAT. *(Fagus)*
Odontia breviseta KARST. (det. ERIKSS.), *hydnoides* (CKE. et MASS.) v. H. *(Fagus)*
Pellicularia vaga (BERK. et CURT.) ROGERS
Peniophora argillacea (BRES.) BRES., *guttulifera* (KARST.) SACC., *incarnata* (PERS. ex FR.) KARST., *pallidula* (BRES.) BRES. (det. ERIKSS.), *pubera* (FR.) SACC. *(Fagus)*, *setigera* (FR.) v. H. et L. *(Fagus)*, *velutina* (DC. ex FR.) CKE.
Polyporus albocarneogilvidus ROMELL (Syn. *P. colliculosus* PERS.) (det. ERIKSS.), *applanatus (Fagus)*, *caesius (Fagus)*, *cuticularis* FR. *(Fagus)* (det. ERIKSS.), *ferruginosus* FR. (det. ERIKSS.), *fomentarius (Alnus glutinosa)*, *hirsutus (Fagus)*, *lucidus (Alnus glutinosa)*, *Pfeifferi* BRES. *(Fagus)*, *sulphureus (Alnus glutinosa)*, *ungulatus (Picea abies)*, *varius (Fagus)*, *versicolor (Fagus)*
Poria reticulata FR. *(Fagus)*, *versipora* PERS.
Radulum quercinum (Alnus?)
Sebacina sublilacina MARTIN *(Fagus)*
Thelephora terrestris
Tulasnella araneosa B. et G. *(Fagus)*

Basidiomycetes-Agaricales

Bolbitius vitellinus
Collybia fusipes, mucida
Coprinus comatus, insignis, picaceus
Cortinarius Junghuhnii
Crepidotus mollis
Eccilia undata
Entoloma sericeum
Hypholoma Candolleanum
Lentinus cochleatus, ursinus (Fagus)
Lepiota cristata
Mycena crocata, gypsea, haematopus
Naucoria centunculus
Panaeolus campanulatus, foenisecii
Pholiota erebia, heteroclita (Alnus) (det. M. P. CHR.), *spectabilis Vahlii (aurea)*
Phylloporus rhodoxanthus (angrebet af *Sepedonium chrysospermum)*
Pluteus chrysophaeus, nanus var. *lutescens*
Psathyra gossypina, subnuda
Psathyrella exalbicans ROMAGN. (det. MOSER), *disseminata, orbitarum* ROMAGN. (det. MOSER) (= *prona* ss. LANGE)
Russula atropurpurea KRBH. (det. MOSER), *densifolia, nauseosa* (PERS.) FR. ss. BRES. (det. MOSER), *parazurea* (det. MOSER), *solaris*
Stropharia squamosa
Tricholoma aggregatum
Tubaria autochthona
Volvaria bombycina? (paa Savsmuld), *plumulosa*

Basidiomycetes-Gasteromycetales

Arcangeliella (Octaviania) asterosperma (det. M. LANGE)
Cyathus striatus

Fungi imperfecti

Menispora Libertiana SACC. *(Fagus)*
Sepedonium chrysospermum (på *Phylloporus rhodoxanthus)*

Tirsdag den 4. Oktober 1955. Ekskursion til Tisvilde Hegn. 44 Deltagere, hvoraf 21 Udlændinge. Man startede Kl. 8^{30} i to Turistbusser fra Botanisk Laboratorium, Gothersgade 140, og ankom ved 10-Tiden til Parkeringspladsen i Tisvildeleje. Herfra spadserede Deltagerne nu et ret godt Stykke langs Klitterne og nød samtidig Udsigten over Kattegat. Det tågede Vejr, der havde hersket om Morgenen, var nu afløst af strålende Solskin. Derpå drejede man ind i Skoven, gik ned imod Brantebjerglinien og tilbage ad Gærdevej til Nordhusvej, hvor Busserne tog Deltagerne op og kørte dem til Tisvilde Kro. Her indtoges Kl. 13^{00} den bestilte Frokost (Smørrebrød, Øl, Kaffe og Wienerbrød), og Kl. 14^{30} kørte Busserne tilbage til Botanisk Laboratorium, hvor der fandt en kortvarig Drøftelse Sted af de indsamlede Svampe.

Tisvilde Hegn viste sig både arts- og individmæssigt set at være betydeligt rigere på Svampe end Gribskov og Jægersborg Dyrehave,

Ekskursion til Tisvilde Hegn 4.10.1955.
Vandring langs Klitterne. I Forgrunden fra venstre: E. BILLE HANSEN, K. HAUERSLEV, Frk. KARIN ASCHAN, MAAS GEESTERANUS, Fru HELLMERS og E. HELLMERS. — Fot. MEINH. MOSER.

hvad der bl. a. kom frem ved, at Agaricaceerne på denne Ekskursion — i Modsætning til de to foregående — nu dominerede Floraen, idet de udgjorde 89 Arter af det samlede noterede Artsantal på 144. Også på denne Ekskursion samledes flere for Landet nye Arter, nemlig den imperfekte *Chalara strobilina* SACC. på Kogle af *Pinus silvestris* (det. DENNIS), *Cortinarius (Dermocybe) croceifolius* (det. M. MOSER), *Hyaloscypha curvipila* GRELET på nedfaldne halvrådne Nåle af *Pinus silvestris* (det. DENNIS) og *Russula torulosa* (det. LE GAL).

En fuldstændig Artsfortegnelse følger nedenfor.

Ascomycetes

Cenangium ferruginosum (gamle Apotecier paa *Pinus silvestris*, det. DENNIS)
Chlorociboria (Chlorosplenium) aeruginosa (Apotecier paa *Betula)*
Helvella atra
Hyaloscypha curvipila GRELET (nedfaldne Naale af *Pinus silvestris)* (det. DENNIS), *Stevensonii* (B. et BR.) NANNF. *Pinus silvestris)* (det. DENNIS)
Hypomyces rosellus A. et S. (paa *Stereum hirsutum* paa *Betula)* (det. M. P. CHR.)
Lophium mytilinum FR. (raadden Gren af *Pinus silvestris)* (det. DENNIS)
Lophodermium conigenum (BRUNAUD) HILITZER (paa Kogle af *Pinus silvestris*, det. DENNIS)
Phialea strobilina (FR.) SACC. (umodne Apotecier paa Kogle af *Pinus silvestris)* (det. DENNIS)
Pleospora (Sphaeria) rubelloides (PLOWR.) WEBSTER *(Ammophila arenaria*, det. WEBSTER)
Poronia punctata (Hestegødning)

Basidiomycetes-Aphyllophorales

Corticium bicolor PECK (under MOS), *byssinum* (KARST.) MASS. *(Betula), confine* B. et G. *(Fagus), fibrillosum* (BURT) LUNDELL *(Picea), fumosum* (FR.) FR., *Lundellii* LITSCH. *(Picea)*
Daedalea quercina (Quercus)
Gloeocystidium citrinum (PERS.) LUNDELL, *roseo-cremeum* (BRES.) BRINKM., *tenue* (PAT.) v. H. et L.
Grandinia mutabilis (PERS.) B. et G. *(Fraxinus)*
Hydnum auriscalpium (Pinus silvestris), (Hydnellum) ferrugineum (FR.) KARST. (det. GEESTERANUS), *(Phellodon) niger* (FR.) KARST. (det. GEESTERANUS)
Merulius tremellosus
Mycoleptodon fimbriatus (Picea)
Odontia arguta (Picea), bicolor (Pinus)
Pellicularia subcoronata (v. H. et L.) ROGERS, *vaga* (B. et C.) ROGERS
Peniophora alutaria BURT, *argillacea* (BRES.) BRES., *byssoides* (PERS. ex FR.) v. H. et L. *(Betula, Fagus, Picea), glebulosa* (BRES.) SACC. et SYD. *(Picea), hirtella* B. et G. *(Picea), incarnata, pithya* (PERS.) ERIKSS. *(Picea), sanguinea* (FR.) BRES. *(Picea), setigera* (FR.) v. H. et L. *(Picea)*
Polyporus melanopus
Poria eupora KARST., *subtilis* (SCHRAD.) BRES.
Sistotrema Brinkmannii BRES. *(Picea), muscicola* (PERS.) (MOS)
Stereum hirsutum (Betula)
Tomentella fusca (PERS.) SCHROET. *(Betula), isabellina* (FR.) v. H. et L., *nigra* v. H. et L. *(Picea), Pilatii* LITSCH., *pseudoferruginea* SKOVST., *pseudofusca* SKOVST.
Tomentellina bombycina (KARST.) B. et G.

Basidiomycetes-Agaricales

Amanita muscaria
Boletus felleus, granulatus, luteus, piperatus, rufus, scaber, subtomentosus, versicolor
Cantharellus aurantiacus, cibarius
Clitocybe fragrans, odora, rivulosa
Collybia conigena
Cortinarius (Phlegmacium) allutus (det. MOSER), *(Inoloma) anomalus* (det. MOSER), *cinnamomeo-lutescens* (HRY.) *(C. cinnamomeus* ss. LGE., det. MOSER), *collinitus* (det. MOSER), *(Dermocybe) croceifolius* PECK (det. MOSER) (nær *C. cinnamomeus* ss. LGE., men kraftigt gul i alle Dele), *(Hydrocybe) erythrinus* (det. MOSER), *malicorius, mucosus* (det. MOSER), *paleaceus* (Duft af *Pelargonium), pseudosalor, semisanguineus, (Phlegmacium) spilomeus* (det. MOSER), *trivialis, vibratilis* (det. MOSER)
Entoloma nidorosum, nitidum, rhodopolium
Flammula astragalina, penetrans
Galera clavata, mycenopsis, tenera
Gomphidius glutinosus, viscidus
Hebeloma crustuliniforme, mesophaeum
Hygrophorus agathosmus, conicus, Langei (constans LGE.)
Hypholoma Candolleanum, capnoides, hydrophilum, sublateritium
Inocybe geophylla, geophylla var. *lilacina, lacera, lanuginosa, sindonia*
Lacrymaria lacrymabunda
Lactarius deliciosus, rufus, torminosus, vietus
Mycena alcalina, leptocephala, zephirus
Nyctalis asterophora (Russula adusta)
Panaeolus acuminatus
Paxillus atrotomentosus (Picea)
Pluteus salicinus
Psalliota Bernardii (det. MOSER)
Psathyrella disseminata
Russula adusta, aeruginea, claroflava, depallens, emetica, fallax, farinipes, graveolens, lepida, nauseosa, livescens, Queletii, rubra KRBH. (det. MOSER), *sardonia, torulosa* BRES. (nær *R. sardonia,* men bliver ikke rød med NH_3) (det. LE GAL), *Velenovskyi, venosa (nitida), vesca, violacea (Knauthii)* (det. LE GAL), *xerampelina*
Stropharia semiglobata

Basidiomycetes-Gasteromycetales

Calvatia excipuliformis (PERS.) PERDECK (det. GEESTERANUS)

Fungi imperfecti

Chalara strobilina SACC. (Kogle af *Pinus silvestris)* (det. DENNIS)

PARASITISKE MIKROMYCETER

SAMLET PÅ JUBILÆUMSEKSKURSIONERNE

af Dr. phil. I. JØRSTAD

G = Gribskov, 2. Oktober.
J = Jægersborg Dyrehave, 3. Oktober.
T = Tisvilde Hegn, 4. Oktober.

Uredinales

II = Uredosporer,
III = Teleutosporer.

Coleosporium campanulae LÉV. På *Campanula rotundifolia.* T (II +III).
C. senecionis KICKX. På *Senecio vulgaris.* T (III).
C. tussilaginis (PERS.) LÉV. s. str. På *Tussilago farfara.* G (II+ III).
Disse tre *Coleosporium*-Racer tilhører Samlearten *Col. tussilaginis* s. l.

Melampsora caprearum THÜM. (syn. *M. larici-caprearum* KLEB.). På *Salix caprea*. G (III).

M. populnea (PERS.) KARST. (syn. *M. tremulae* TUL.) På *Populus tremula*. G ([II]+III). T ([II]+III).

Melampsoridium betulinum (FR.) KLEB. På *Betula verrucosa*. G (II).

Phragmidium violaceum (SCHULTZ) WINT. På *Rubus* sp. G (III).

Puccinia agropyrina ERIKS. På *Agropyron repens*. G (II+III). Tilhører Samlearten *P. rubigo-vera* WINT.

P. airae MAYOR & CRUCH. På *Deschampsia caespitosa*. G (II).

P. arenariae (SCHUM.) WINT. På *Stellaria holostea*. G.

P. brachypodii OTTH (syn. *P. baryi* WINT.) På *Brachypodium sylvaticum*. J (II).

P. caricina DC. På *Carex acutiformis*. J (II+III). På *C. hirta*. J (II+III).

P. coronata CORDA. På *Agrostis tenuis*. T (II+III). På *Festuca pratensis*. G (II+III). På *Holcus lanatus*. G (II+III).

P. dioecae P. MAGN. s. l. (syn. *P. silvatica* SCHROET.) På *Carex leporina*. G (II+III).

P. graminis PERS. På *Agropyron repens*. G (III). På *Deschampsia caespitosa*. G (II).

P. lapsanae FUCK. På *Lapsana communis*. G (II+III).

P. magnusiana KÖRN. På *Phragmites communis*. T (III).

P. millefolii FUCK. På *Achillea millefolium*. G. Tilhører Samlearten *P. cnici-oleracei* PERS.

P. obscura SCHROET. På *Luzula pilosa*. T (II).

P. poae-nemoralis SCHROET. (syn. *P. poae-sudeticae* WEST.) På *Poa palustris*. G (II+III). På *Poa pratensis*. T (II).

P. pratensis A. BLYTT. På *Avena pratensis*. T (II).

P. punctata LINK. På *Galium verum*. G (II+III). T (III).

P. punctiformis (STR.) RÖHL. (syn. *P. obtegens* TUL., *P. suaveolens* ROSTR.) På *Cirsium arvense*. G (III).

P. pygmaea ERIKS. På *Calamagrostis epigeios*. G (II+III). T (II+III).

P. tanaceti DC. På *Chrysanthemum vulgare*. G (III).

P. violae DC. På *Viola riviniana*. G (III).

Pucciniastrum circaeae (WINT.) SPEG. På *Circaea lutetiana*. J (II+III).

P. epilobii OTTH (syn. *P. abietichamaenerii* KLEB.) På *Chamaenerion angustifolium*. T ([II]+III).

P. guttatum (SCHROET.) HYL., JØRST. & NANNF. (syn. *P. galii* (LINK) E. FISCH.) På *Galium hercynicum*. G (II).

Uromyces airae-flexuosae FERD. & WINGE. På *Deschampsia flexuosa*. G (II).

U. euphorbiae-corniculatae JORDI (syn. *U. loti* A. BLYTT). På *Lotus corniculatus*. G (II).

U. fabae DE BARY. På *Vicia sepium*. G (II+III).

Ascomycetes

Erysiphe graminis DC. På *Anthoxanthum odoratum*. T (Konid.)

E. lamprocarpa (WALLR.) DUBY. På *Plantago major*. T.

E. martii LÉV. På *Trifolium medium*. G (Konidier).

E. pisi DC. På *Vicia cracca*. T (Konidier).

Microsphaera alphitoides GRIFF. & MAUBL. På *Quercus robur*. T. (Konidier).

Phyllachora graminis (PERS.) FUCK. På *Agropyron repens*. G, T. På *Dactylis glomerata*. T.

Ph. sylvatica SACC. & SPEG. På *Festuca rubra*. G.

Pseudopeziza repanda (FR.) KARST. På *Galium palustre*. G.

Rhytisma acerinum (PERS.) FR. På *Acer pseudoplatanus*. T.

Taphrina betulae (FUCK.) JOHANS. På *Betula verrucosa*. G.

JUBILÆUMSMIDDAGEN DEN 2. OKTOBER 1955.

Jubilæets Hovedbegivenhed var ganske naturligt Festligholdelsen af selve 50-Årsdagen for Foreningens Stiftelse, den 1. Oktober 1905. Festkomiteen havde ønsket at fejre Stiftelsesdagen ved en Festmiddag i Tilslutning til en Svampeekskursion, men da denne Dag i 1955 faldt på en Lørdag, anså man det for mest hensigtsmæssigt at henlægge Festlighederne til om Søndagen den 2. Oktober. Det besluttedes derpå at lade Svampeekskursionen gå til Gribskov og at afholde Jubilæumsmiddagen på „Slotspavillonen" i Hillerød.

Som nærmere omtalt under Jubilæumsekskursionerne indfandt Deltagerne i Gribskov-Ekskursionen sig Kl. 17^{00} på „Slotspavillonen", hvor de mødtes med de øvrige, der havde indtegnet sig til Festmiddagen. Ialt deltog 71 i denne, nemlig 42 af Foreningens Medlemmer (Pris pro persona Kr. 45,-) og 29 Gæster. Som Gæster var indbudt Formanden for Dansk Botanisk Forening, Professor, Dr. phil. JOHS. BOYE PETERSEN med Frue og 27 udenlandske Mykologer, hvoraf enkelte havde deres Fruer med. Navnene på de udenlandske Gæster er nævnt S. 214-215.

Kl. 18^{00} samledes man ved de festligt dækkede Borde, der var dekoreret med levende Lys, Blomster, skænket af Landbohøjskolens Have, og Flag for hver af de 11 Nationer, der var repræsenterede. Formanden var flankeret af Formændene for den engelske og den franske mykologiske Forening, henholdsvis Damerne, Dr. LILIAN E. HAWKER og Dr. MARCELLE LE GAL. Ved Hovedbordet sad desuden Formændene for de øvrige udenlandske mykologiske Foreninger, Professor R. TUOMIKOSKI (Finland), Dr. G. L. VAN EYNDHOVEN (Holland) og Lektor J. STORDAL (Norge) samt Professor JOHS. BOYE PETERSEN og de udpegede Æresmedlemmer.

I Velkomsttalen udtalte Formanden bl. a., at det havde været Bestyrelsens Ønske at markere Jubilæet ved at indbyde en Række Mykologer fra Udlandet, og at det havde været den en stor Glæde, at så mange havde efterkommet Indbydelsen og dermed været med til at kaste Glans over Festen. Desværre savnedes flere fremragende Mykologer, som ikke havde været i Stand til at deltage, og det vedtoges med Håndklap at afsende Hyldesttelegrammer til Professor R. HEIM (Paris), Overlærer F. H. MØLLER, Dr. SETH LUNDELL (Uppsala) og Dr. J. RAMSBOTTOM (London).

Derpå valgtes Professor D. MÜLLER til Toastmaster, hvorefter Suppen, naturligvis Champignonsuppe, blev budt rundt, medens der skænkedes Madeira eller Sherry i Glassene. Først efter at den varme

Ret, „Slotspavillonen"s Specialitet, „Slotsgryden" (Médaillon de Porc à la Chateau), hvortil serveredes Rødvin, var gået to Gange rundt, nåede man frem til Festens Højdepunkt, Udnævnelsen af fire Æresmedlemmer, de første i Foreningens Historie. På Bestyrelsens Vegne proponerede Formanden følgende fire Medlemmer som Æresmedlemmer for deres Fortjenester af Foreningen og af den mykologiske Forskning, nemlig Øjenlæge, Dr. med. VALDEMAR HERTZ, Retspræsident KAJ MUNDT, Overlærer F. H. MØLLER og Professor, Dr. phil. ØJVIND WINGE. Et smukt trykt Æresdiplom i Mappe overraktes hver enkelt, bortset fra Overlærer F. H. MØLLER, som senere fik det tilsendt, og en Sang til Æresmedlemmernes Pris, „Idag er Kurven — om ikke fuld", blev afsunget. Slutningsverset lød:

Se! Skoven fejrer de femti Aar,
har klædt sig spraglende smuk.
Dryaders Hyldest jert Øre naar
i Kildens koglende Kluk.
— Til WINGE's Ære og ligervis
til MUNDT's og MØLLER's og HERTZ's Pris
slaar *Pan* en Trille paa Fløjten
i Takt til Gøgens Kuk-Kuk.

Sangen, der gik på Melodien „Hvor Skoven dog er frisk og stor", var forfattet af „Ingen ved hvem", hvilket Pseudonym senere viste sig at dække over Postmester J. P. JENSEN's Navn.

Efter Sangen holdt Formanden Jubilæumstalen, der er trykt andetsteds i dette Hefte. En Oversættelse af Talen til Engelsk var omdelt til alle Udlændingene.

Toastmasteren åbnede nu Sluserne for Talernes Strøm og gav først Ordet til Retspræsident K. MUNDT, som takkede på Æresmedlemmernes Vegne for den ærefulde Udnævnelse. Professor J. A. NANNFELDT takkede på de svenske Mykologers Vegne for det smukke Jubilæumshefte, der var viet ELIAS FRIES' Minde, og Professor BOYE PETERSEN overbragte en Lykønskning fra „Storebroder" (Botanisk Forening) til „Lillebroder" (Svampeforeningen). Han havde med Glæde set, at „Foreningen til Svampekundskabens Fremme" havde taget Opgaver op, som Botanisk Forening ikke magtede og derfor havde ladet ligge. Dr. LILIAN E. HAWKER talte på The British Mycological Society's Vegne og overrakte en smuk kalligraferet Adresse, og Dr. MARCELLE LE GAL kom med Lykønskninger fra Société mycologique de France. Så blev den anden Sang afsunget, en Hyldest til

„Kvinden, der går på Svampejagt" og er Årsagen til, at „vor Forening trods femti År, endnu i den fagreste Blomstring står". Sangen, der gik på Melodien „En Sekstur, ak i det lille Ord", var et „Poem af ukendt Forfatter", bag hvilket Navneskjul det også viste sig, at Postmester J. P. JENSEN var at finde.

Derefter fortsatte Talernes Strøm. Først holdt Dr. ALBERT PILÁT fra den tjekkiske Svampeforening en bevæget Tale på Tysk, derefter talte Formanden for den unge „Norsk Soppforening", Lektor JENS STORDAL, Formanden for „Finlands Svampvänner", Professor RISTO TUOMIKOSKI, Dr. W. BÖTTICHER, Leder af Zentralstelle für Pilzforschung und Pilzverwertung (München), og Ingeniør STEFFEN HERTZ sluttede af i denne Omgang med en spøgefuld Tale.

Desserten (Gâteau Rubinstein) var forlængst blevet budt om, og nu kom Turen til Oplæsning af en Række Lykønskninger, der var indløbet til Jubilæumsmiddagen. Professor ROBERT ELIAS FRIES, Stockholm, takkede „för den vackra minnesgärd som ägnats min farfaders minne". Fra Professor ELIAS MELIN kom følgende Hilsen: „Svenska Botaniska Föreningen och jag själv framföra till Danska Mykologiska Föreningen vår varmaste lyckönskan och hyllning. Med stor beundran för dess gagnrika verksamhet under gångna år önska vi att föreningen alltid måtte behålla samma ungdomliga livskraft som hittills".

Yderligere var der Lykønskninger fra G. C. AINSWORTH, G. R. BISBY og J. RAMSBOTTOM (alle England), R. HEIM og F. MANGENOT (begge Frankrig) og EMIL DEHN, Fru ELLEN HERTZ (Hertz Bogtrykkeri), Frk. R. MUNKVAD (der opholdt sig i Venedig) og F. H. MØLLER. I øvrigt indløb der under hele Jubilæet Hilsener, som vil findes længere fremme.

Følgende Telegram: „Hjertelig til Lykke! Kan desværre ikke deltage i Festmiddagen. *Amanita phalloides,*" vakte naturligvis stor Munterhed.

Efter Telegrammernes Oplæsning sang man den tredie af de til Jubilæet affattede Sange, „En Skål, Jubilarer, mødt frem til Fest i Dag" (Mel.: „En Skål for den Mø i blufærdige Vår"), som var skrevet til Foreningens Pris af et gammelt Medlem, Fru GERDA WARRER CLAUSEN, og derpå afsluttede Dr. MEINH. MOSER Talernes lange Række med en Hilsen fra „Österreichische mykologische Gesellschaft". Kort efter hævedes Bordet.

Medens man hyggede sig ved en Kop Mokka m. m. i Restauranten, ryddedes Middagssalen og indrettedes til Forevisning af Lysbilleder. Professor D. MÜLLER fremviste derefter på en munter Måde et halvt Hundrede Lysbilleder, dels af Foreningens Stiftelse og gamle Bestyrel-

sesmedlemmer, dels fra Ekskursionerne gennem Årene. Nogle af Billederne er gengivet på S. 131—143.

Tiden gik hurtigt, og det var nær Midnat, da Selskabet brød op og i Busser kørte tilbage til København.

Som omtalt ovenfor modtog Foreningen under hele Jubilæet mange Lykønskninger. Foruden fra de allerede nævnte indløb der Lykønskninger fra: P. HEINEMANN (Belgien), J. W. GROVES (Canada), E. J. H. CORNER, W. P. K. FINDLAY, F. B. HORA, A. F. PARKER-RHODES, Miss E. M. WAKEFIELD (alle England), J. B. ANTERMET og G. VIENNOT-BOURGIN (Frankrig), P. CRITOPAULOS (Grækenland), H. S. C. HUIJSMAN (Holland), R. CIFERRI (Italien), ASBJØRN HAGEN (Norge), J. PINTO-LOPES (Portugal), E. GÄUMANN og W. SHÄRER-BIDER (Schweiz), SETH LUNDELL, HARRY SVENSSON og ARVID SWÄRD (Sverige), H. KÜHLWEIN og W. NEUHOFF (Tyskland), W. W. DIEHL, C. W. DODGE, Miss A. E. JENKINS, R. P. KORF, G. W. MARTIN, ALEX. H. SMITH og J. A. STEVENSON (alle U.S.A.).

Til Slut skal anføres, at Jubilæet omtaltes i flere udenlandske mykologiske Tidsskrifter. Således skrev ALBERT PILÁT en længere, illustreret Opsats i det tjekkiske Svampetidsskrift: „Jubilejní kongres Dánské mykologické společnosti v Kodani 1955" (Česká mykologie 10: 9-14, 1956) og Fru LIESEL SCHÄFFER, Enke efter JULIUS SCHÄFFER, skrev i det schweiziske Tidsskrift om „Internationaler Jubiläumskongress der Dänischen Mykologischen Gesellschaft" (Schweiz. Zeitschr. f. Pilzkde. 34: 67-68, 1956).

ØKONOMIEN.

Foreningen havde den store Glæde at modtage Tilskud til Jubilæet fra mange Sider, nemlig fra:

Rask-Ørsted Fondet	Kr.	1.000,—
Jakob E. Langes Fond	„	1.500,—
R. Collstrop A/S	„	600,—
De danske Imprægneringsanstalter...	„	300,—
A. Rindom	„	300,—
Agro-Kemi A/S	„	50,—
	Kr.	3.750,—

Det er Foreningen en kær Pligt at benytte Stedet her til endnu en Gang at bringe de pågældende Fonds og Firmaer sin varmeste Tak for den store Imødekommenhed, de udviste over for Foreningens Ønsker.

I Forbindelse med Jubilæumsfondet, der var oprettet på Grundlag af Tilskud fra „Flora Agaricina Danica-Fondet", ialt Kr. 3.500,-, og Betalingen for Jubilæumsmiddagen og Ekskursionerne samt Indtægten fra Svampeudstillingen disponerede Foreningen over ialt Kr. 9.769,- til Afholdelse af alle Udgifter i Forbindelse med Jubilæet. Da disse beløb sig til Kr. 9.404,58, ses det, at Jubilæet ikke kostede Foreningen en Øre, men faktisk gav et Overskud på godt 350 Kr.

Nedenfor følger en Regnskabsoversigt.

INDTÆGTER

Fonds og Firmaer	Kr.	3.750,—
Flora Agaricina Danica-Fondet	„	3.500,—
Jubilæumsmiddag og Ekskursioner	„	2.010,—
Indtægt fra Udstillingen	„	509,—
	Kr.	9.769,—

UDGIFTER

Jubilæumsmiddagen	Kr.	3.583,42
Ekskursioner og Møder	„	1.147,89
Svampeudstillingen	„	621,85
Rejsetilskud	„	3.901,60
Tilskud til „Friesia" V, 2	„	149,82
	Kr.	9.404,58
Saldo	„	364,42
	Kr.	9.769,—

Såvel for Foreningens Medlemmer som for de udenlandske Gæsters Vedkommende blev Jubilæet en stor Oplevelse. Under Samværet på Udstillingen, på Ekskursionerne og under Drøftelsen bagefter af det indsamlede Svampemateriale blev der Lejlighed til lærerige og frugtbare Diskussioner vedrørende den rette Opfattelse af forskellige Svampearter og mange andre mykologiske Spørgsmål.

Vejret var strålende netop i de fem Dage, Jubilæet varede. Regnen begyndte først sent om Tirsdagen den 5. Oktober at strømme ned, men da var Jubilæet sluttet. Det smukke Vejr bidrog naturligvis sit til Succes'en.

N. Fabritius Buchwald.

Friesia udkommer i Hefter med tvangfrit Mellemrum. Aarskontingent er *10 Kr.* Ny tiltrædende Medlemmer af Foreningen til Svampekundskabens Fremme faar gratis tilstillet, hvad der er udgivet i Indtrædelsesaaret.

Sekretariatets og Redaktionens Adresse er Rolighedsvej 23, København V. Her modtages saavel Ind- og Udmeldelser af Foreningen som Anmeldelser om Flytning. Al Korrespondance vedrørende Tidsskriftet rettes til samme Adresse.

Af det afsluttede „Meddelelser fra Foreningen til Svampekundskabens Fremme" haves endnu et Restoplag, der kan afgives til en Pris af 5 Kr. pr. Bd. (Bd. I (1912—15) og II (1916—20), inkompl.; Bd. III—IV (1921—30), kompl.).

Friesia is published at irregular intervals.

Subscription price. Danish crowns 10.00 per year.

Address. Department of Plant Pathology. The Royal Veterinary and Agricultural College, Rolighedsvej 23, Copenhagen V, Denmark.

The price of single numbers of vol. IV, V and VI is Danish crowns 15.00.

A New Standard Iconography of Agarics.

JAKOB E. LANGE, the famous Danish mycologist, during his lifetime made a series of excellent water-colour figures with short descriptions of about 1200 species of Agarics. The original paintings were purchased by the Botanical Museum of the Copenhagen University.

A joint grant of 70.000 Danish Kroner from the Carlsberg Foundation and the Rask-Ørsted Foundation made it possible to publish these during 1935—1940 and to offer the work at a very low price considering its first rate quality and the high cost of colour printing. The entire work consists of five volumes in folio (about 550 pages) and 200 plates in chromo-lithography, the process involving up to ten printings. Altogether about 1200 species are figured. The text includes a complete set of keys and a description of all the species including spores, basidia, cystidia etc.

This iconography is of great importance to mycologists all over the world, many species of agarics being cosmopolitan.

The price has been fixed at 700 Danish Kroner for the complete work. Single volumes are *not* sold.

We shall be glad to send a specimen plate and a page of the text in order that an opinion may be formed of the high standard of the work.

Please apply to:

Flora Agaricina Danica

The Society for the Advancement of Mycology
The Royal Veterinary and Agricultural College,
23, Rolighedsvej, Copenhagen V
Denmark.